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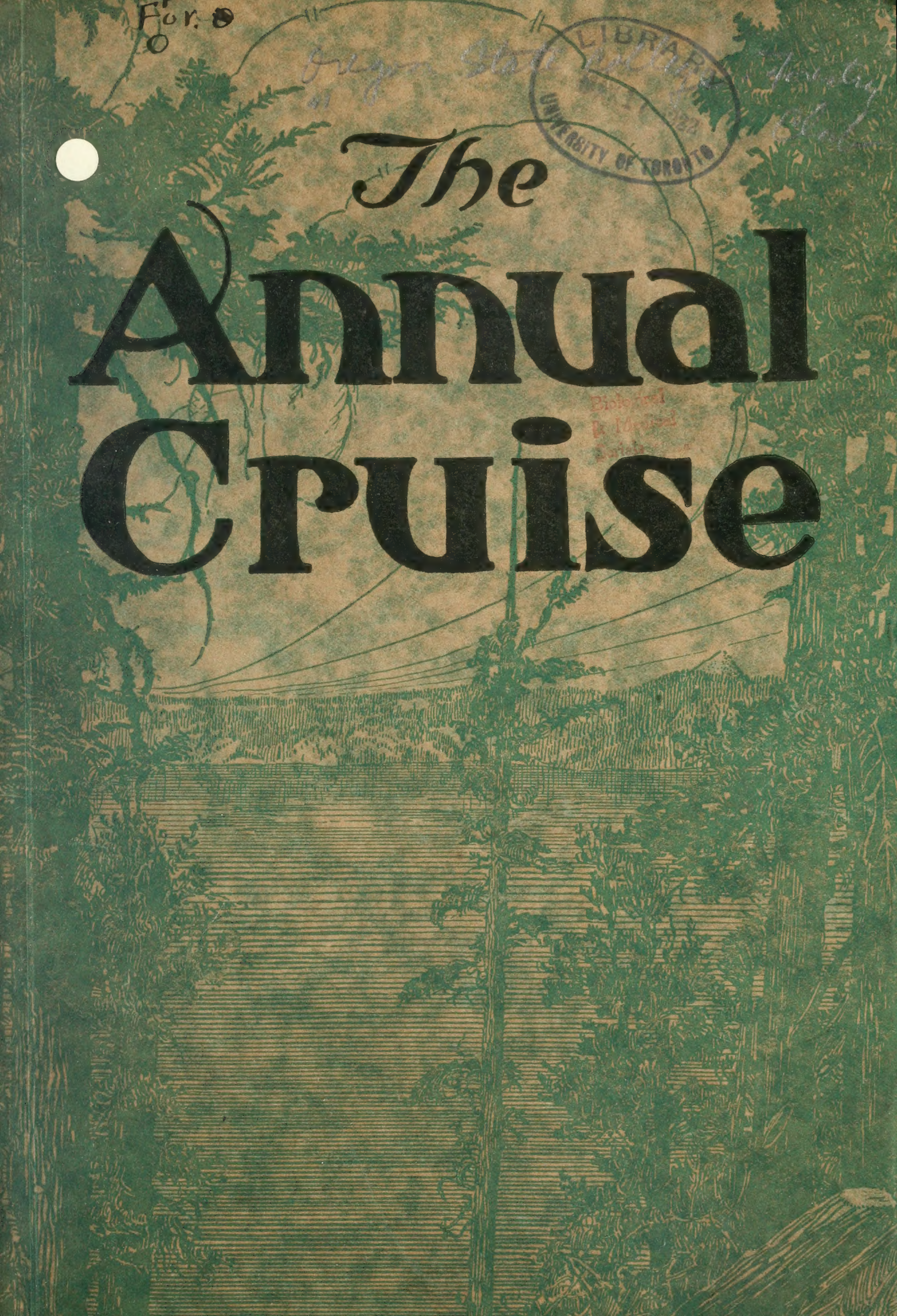

# The Annual Cruise

Biological
& Medical
Serials

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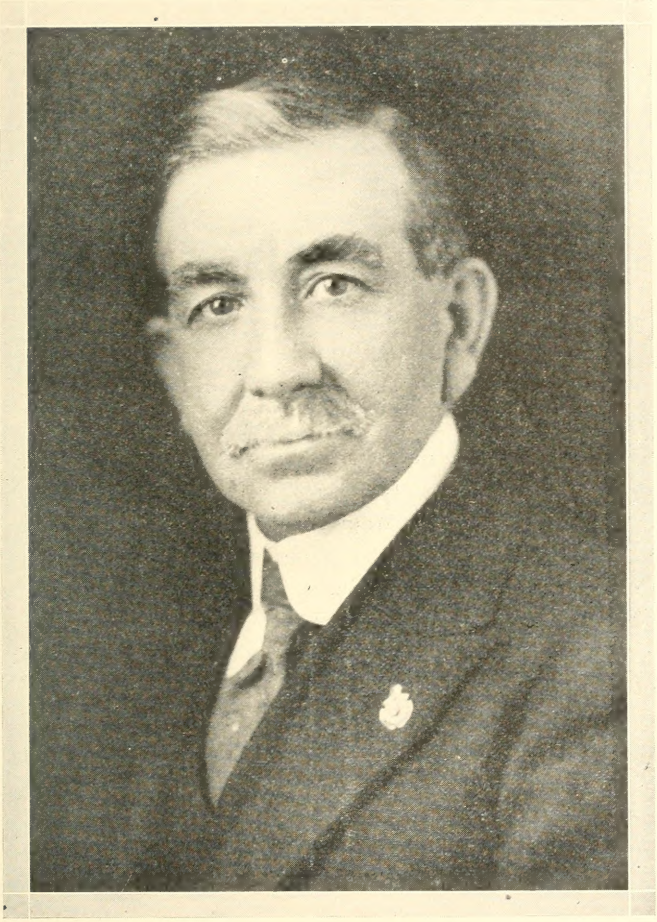
Biological
& Medical
Serials

To that Regent of the College,
whose unfailing interest in the
School of Forestry has made
its achievements possible:

**George M. Cornwall**



GEORGE M. CORNWALL

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# A Fool There Was!

There was a certain rich man whose sense of humor had developed along unusual lines. Circumstantial evidence goes to show that he had read a profusely illustrated history of Rome, and, while his mental pabulum was in an unusually plastic state, hit upon that portion of the narrative in which was depicted "kultured" old Nero, ecstatically rasping his violin while the Eternal City ascended heavenward in smoke. Be all this as it may, this wealthy chap proceeded along exceedingly unconventional economic lines.

This is what he did: He organized a staff of architects, contractors, landscape artists, together with all the necessary personnel to lay out and build a city, from the ground up to the last brick on the chimney. His idea was to build a city made up of average American homes. His architects were instructed to build houses at an approximate cost of $5000 each. Everything was furnished complete, from the Victrola in the living room to the skillet in the kitchen. It just happened that he built 2688 of these cozy dwellings. He had advertised it far and wide that one of these beautiful places would be given to families of four each, and the rich chap's agents had listed enough happily expectant people to fill the entire number. The whole country was agog over this Utopian scheme of creating at one stroke a full fledged city with a population of 10,752 souls.

Everything had been arranged for the grand day of occupation. The fortunate people who were to populate this wonderful place stood like Moses of old, gazing into the promised land. But, like the Hebrew prophet, they were not to set foot upon it. On the evening before the day of fulfillment a strong east wind came up. The wind was high and the humidity was low. As darkness settled upon the scene, a hundred secret agents of the rich man set fire to a hundred different homes and in a fleeting hour the beautiful city disappeared in a raging sea of flames. The blackened embers of the morrow, as drear and hopeless as the hearts of saddened, homeless thousands, were the only reminders of the beautiful creation. The perpetrator of the outrage was harried out of the country, and his name became, and remains today, anathema to all people.

A certain state, endowed by nature with more forest wealth than any other in the American Union, each year for the past five years, has burned 448,000,000 feet of merchantable timber. Second growth stuff which, in time, would produce much more timber than the amount indicated, is destroyed at the same time. At the least calculation, the merchantable timber destroyed has a manufactured value of $30 per thousand. Granting this, the State in question is annually burning potential wealth amounting to $13,440,000. Annually mind you! Each year, enough property goes up in smoke in that state to build a city for ten thousand people. Practically all of this loss is preventable under a proper system of fire prevention and control. Every economic consideration points to the fact that the people of future generations will sorely need this timber to build themselves homes. What shall be said of the business judgment of a state, or its sense of responsibility for the comfort and happiness of its future citizens, when it thus thoughtlessly, one might almost say wantonly, permits the destruction of something upon which their very existence depends? And that State is Oregon!

# Forestry Education and Service Is New

**By H. S. NEWINS, Professor of Forestry**

The year 1900 marks the beginning of consistent training in America for technical forestry. Prior to this date certain men of courage and vision had expended their efforts in an attempt to stem the tide of devastation which was annually encroaching upon the forests of the country. The first lectures on technical forestry delivered in America were presented in 1887 at the Massachusetts Agricultural college by Dr. Bernhard E. Fernow. Other colleges had previously considered the subject but only as a branch of botany and not from a professional viewpoint. Also two schools of forestry were established in 1898, but the one, the New York State College of Forestry founded at Cornell University under the leadership of Dr. Fernow, after three years of very creditable effort, was abandoned for political reasons, and the other, the Biltmore Forest School, a small private school established by Carl A. Schenck at Biltmore, N. C., after playing a prominent part in forest utilization, was discontinued in 1914.

The Division of Forestry, Department of the Interior, U. S. A., took a conspicuous part at this time in preparing the public for professional forestry. Offers were made to render advice and assistance to private timber-land owners who desired to practice forest management. These opportunities were accepted by a prompt response on the part of the public. The Division of Forestry unwittingly assisted in the general preparation for professional forestry education by the devotion of the services of a few induividuals to research work. The findings and subsequent publication of these results stand today as monument to the early achievements of such men as Fernow, Filibert Roth, Gifford Pinchot, H. S. Graves, and J. W. Toumey. The success of these pioneers in forestry echoed throughout the country as a challenge for the inauguration of some more elaborate and intensive system of forestry education than was at that time available; a system by which men could be definitely trained to supply the demand now created in the government service.

The challenge was accepted when early in 1900 Yale University announced the receipt of a benefaction of $15,000 for the endowment of a graduate professional school of forestry. The success of this endowment plan is now evidenced by the permanency of the Yale Forest School, and the professional standards which the school has always maintained. The success is in a large part due to the foresight of those who founded the school and who have since maintained its administration. H. S. Graves was elected director of the school in the early summer of 1900. Professor Graves was later assisted by J. W. Toumey. Because these men came to their new posts directly from the Division of Forestry they were aware of the high ideals required in successful public service.

As indicated above some educational work in forestry had already been accomplished in the various institutions throughout the country. Those early endeavors have contributed very largely to the successful development of forestry education in America. Herman H. Chapman who, because of his books and numerous publications, needs no introduction, was graduated from the University of Minnesota in 1899. R. C. Bryant, who, since 1906 has held the chair of Applied Forestry and Practical Lumbering, which was endowed at the Yale University by the National Lumber Manufacturers' association, was graduated from the original New York State Forest School at Cornell University in 1900.

In the year 1900 courses in professional forestry were established at the University of Minnesota. Following the examples of Yale and Minnesota courses were established in forestry at the University of Michigan in June, 1901, with the following principal aims set forth in the college catalog:

"To promote forestry in the State of Michigan.

"To assist in the proper care of State forest lands.

"To care for the University forest reserves.

"To train young men in forestry work."

Filibert Roth who had already achieved notable success in the Division of Forestry, resigned his position there to accept the position of leadership in this larger field of responsibility in forestry education as director of the new school. The influence which Michigan alumni have since exerted in the field of forestry attests to his continued success. The establishment of this department was shortly followed by that of the Michigan Agricultural college in 1902. During the next year the Pennsylvania State Forest Academy, the University of Maine, and also Nebraska University initiated courses in forestry. In 1904 Harvard University established a graduate course in research and specialization in forestry and at this time Iowa State College of Agriculture and Mechanic Arts created its department of forestry.

During the year 1905 Pennsylvania State College and the Colorado School of Forestry, Colorado Springs, fell into line. In 1906 courses in forestry were inaugurated both at the University of Georgia and Wabash college. The year 1907 introduced the college of forestry at the University of Washington and the Forest School at the University of Toronto. At about this time a series of lectures was started at the University of Mississippi. In 1908 a course of lectures for forest rangers was introduced at the Utah Agricultural college, also lecture courses were taken up at the New Brunswick Agricultural college, Canada. About this time the Quebec Forest School was also established.

In 1909 courses in forestry were commenced at the University of Idaho and in the latter part of the year the present School of Forestry at the Oregon Agricultural College had its origin, although the Forest Club at this institution dates back to 1906. Courses in forestry were taken up in 1910 at Kansas University and at Rhode Island Agricultural college. At this time the agitation for forestry education became so intense in New York that plans were laid which produced the Department of Forestry at Cornell University, Cornell's second School of Forestry, in 1910, and the New York State School of Forestry at Syracuse University the year following. The University of Missouri and Washington State college also joined the ranks of forestry education during this latter year. New Hampshire Agricultural college and Purdue University set out upon respective forestry careers in the year 1912, followed in 1914 by the University of Montana, a state school at Bottineau, North Dakota, and the University of California. In 1915 the Department of Forestry at the Colorado Agricultural college became effective although plans had been made for its establishment as early as 1910. Bates college installed a department of forestry in 1918.

From time to time during this period lecture courses in forestry were carried on at Vermont; Berea College, Kentucky; Ohio State college, and Wisconsin. In 1921 British Columbia, Canada, fell into line and inaugurated a department of forestry.

These schools have all had their various exigencies and obstacles to overcome; some have been discontinued. Nevertheless, they have all exerted some influence in the field of education.

At present but sixteen universities and colleges are giving professional courses in forestry while five others offer partial instruction. University of California, Cornell, Harvard, Michigan University, Michigan Agricultural college, University of Washington, New York State college, Oregon Agricultural college, and Yale offer in their college catalogs opportunities for post graduate work, and all but Harvard and Yale give instruction in undergraduate forestry. Excellent instruction in undergraduate professional forestry is also taught at Idaho, Iowa State college, Pennsylvania State college, Mt. Alto, Maine, Minnesota, and Montana. The remaining five institutions which conduct lecture work in forestry but do not pretend to give a degree in professional forestry are Bates, Connecticut Agricultural college, Colorado Agricultural college, Massachusetts Agricultural college, and New Hampshire college.

It is significant that practically all that has been accomplished in the field of professional forestry in America has been the outcome of forestry education during the past two decades. This influence has not been restricted to America alone, but has also made its impression abroad.

The results have been accomplished at a time when the American people are most profligate. The consumption of wood in the United States today is estimated at more than 260 cubic feet per capita. At this rate more lumber is being utilized than is grown annually in this region. As this practice continues the country gradually but surely approaches a timber famine. Forestry education in America has accomplished within two decades more than even the most visionary estimate that might have been made in the 19th century could have anticipated. But in the next two decades it will be taxed to the utmost. An ounce of prevention is worth a pound of cure! When the people of the United States fully realize their perdicament they will seek even more intensely the counsel of forestry education.

The question is often asked "For what service is one fitted when he completes forestry education?" No better reply can be made than a glance at the achievements of those pioneers who have already gone forth into the field of actual endeavor.

Forest education first of all renders public service. Through the loyalty of graduates to country, one fifth of all forest areas of the United States has been made secure from private invasion and safe for the future through restricted present use. These altruistic men are serving in positions requiring executive ability, leadership, and high moral standards. This is true whether the office be that of a chief in charge of a complete organization, or that of a forest ranger who makes his daily reports after vigilant inspection of the forest.

In 1900 the forests of the United States were not adequately managed and protected. Trained men were not immediately available to accept the responsibilities of the necessary engineering, fire protection, grazing, planting, research, and other work. Today such positions are occupied to the extent of public funds appropriated for the purpose. If more funds were immediately forthcoming fifty trained foresters would be added to the national service each year for the next five years.

The influence of forestry education has been felt intensively in at least 21 states of the United States. These commonwealths now have a State forestry department with a technical forester in charge, or they employ technical foresters. Where the organization is in charge of a technically trained graduate of a forest school, it is less subject to political interference. This plan of organization has been perfected in twelve states: California, Missouri, Maryland, Pennsylvania, New Hampshire, Tennessee, Virginia, Colorado, Minnesota, Maine, Connecticut, and North Carolina. The graduates in state forestry work have framed and carried into effect many valuable laws, among which are those enabling the Federal and State governments to cooperate in the protection of watersheds. Cooperating fire protection associations have been developed through the aid of state forestry.

The public has learned that forests are essential for the health and recreation of the people. Municipalities have employed forest school graduates to manage the forests upon the city watersheds, to maintain public parks, and to beautify through systematic planting the thoroughfares of the community.

The influence of forestry education originating in the United States has not been restricted to the North American continent. The Philippine Forest school and the Philippine Forest service are both under the leadership of American graduates. Likewise with the forest school in South Africa and educational institutions in China. China has looked to America for technical assistance in relieving that nation from the barreness of its forest exile. Chinese "indemnity" students are now in attendance at American forest schools.

Norway grants an annual scholarship to American foresters that the students of these two nations may benefit mutually in the pursuit of their studies.

American foresters are employed in the performance of their duties in practically every civilized corner of the world. The large rubber plantations in the Malay Archipeligo are using these technical men to make their silvical investigations. India has recently elected an American forester to supervise the development of logging plans for the more inaccessible forest regions of the British Empire. New Zealand has appointed a graduate from the United States to develop a modern system of forestry service for that country.

Perhaps the most significant feature of the influence that forestry education has exerted is the gradual acceptance of its principles in private practice. Foresters are now very generally employed by industry. Many are executives in large lumber companies, or are acting as logging engineers. Others are active in trade associations including the lumber, paper, and pulp industries. These leaders have occupied strategic positions from which to explain to private capital the practical interpretation of forestry. That they have in most cases diplomatically utilized this prerogative is now evident by the hearty support these associated industries are giving to certain pending legislation. Foresters have been employed by industry to manage forest properties, in capacities ranging from coal companies to private estates. Railroad companies have organized forestry departments and also employ consulting foresters to assist them in the management of their forest holdings. Special wood-using industries such as paper and pulp, tannin, hardwood distillation, and softwood distillation, naval stores, sugar maple, and others have, in their performance of their operations drawn freely from the ranks of technical foresters. There may be included also those specialized phases of industry such as wood preservation, kiln drying, and chemical utilization of lumber byproducts.

The influence of service was aptly shown in the recent World War. Many of the officers in the front line trenches received their preliminary training in forestry. The 10th and 20th Engineers of the A. E. F. were organized as forest regiments. The task of seasoning and inspecting the woods used for war-time purposes came under the leadership of foresters whether for airplanes, ships, artillery vehicles, or gun stocks. Imbued with the spirit of service to country it is not strange that the foresters so willingly made the necessary sacrifices involved—and many made the supreme sacrifice.

Most of the modern text books in forestry have been written by American foresters. Splendid results have been achieved in this field. Forest schools have been enriched with these valuable additions to the libraries. The schools have also acquired forest areas which have been placed under intensive management and are demonstrations of practical forestry.

With all that has been said of the history of forestry education and the service it has rendered, there is an indescribable phase of the subject which beckens to every wholesome, red-blooded American. The profession of forestry renders responsible service. It requires men physically and mentally fit.

# Lumber Industry Requires Salesmanship

**By R. E. IRWIN, District Sales Manager Weyerhaeuser Sales Company, Boise, Idaho**

One of the great basic industries of America is the lumber industry. It is second only to agriculture, and only three industries employ more labor, viz: agriculture, mining and transportation. Lumber leads all the manufacturing industries in the employment of labor. No manufacturing industry is of such vital importance to the wage earner of the Pacific Northwest, as that of lumber. Census figures show that from 50 percent to 60 percent of all people engaged in manufacturing enterprises in those states are employed in the manufacture of lumber. The prosperity of this section of our country is to a great extent dependent upon the prosperity of this great basic industry.

The Northwest is particularly fortunate in having such a vast forested area, over 50 percent of the standing timber of our country being in this section. The time is rapidly approaching when the Pacific Coast states will be the chief source of our country's timber supply. The East and Middle West are no longer capable of supplying the demand in those territories. The yellow pine forests of the South are being rapidly depleted; in the last few years timber owners and mill men of the South have been acquiring large tracts of Western timber in order to perpetuate their business, and developments of this character will be very rapid in the next five to ten years.

Unfortunately, the growth of the lumber industry in the West has been seriously retarded, largely because it has not proven sufficiently remunerative to those engaged in it, and this is primarily due to the lack of a market which will absorb the output at a profit. Most of the earlier manufacturers in this section were timber owners and loggers who, in many cases, found the carrying charges heavy and acquired sawmills as a means of marketing their timber. Many of these were keen, forceful business men with a thorough knowledge of timber and of logging methods, but unskilled in manufacture and with little or no knowledge of markets or modern merchandising methods. Lacking this knowledge, they were dependent on either men or agencies for the marketing of their lumber. In many cases those who sold the stock had no financial interest in it, except to obtain it at as low a price as possible in order to make a profit on the transaction. During periods of market depression or financial crises, it was often impossible for the producer to market his stock at anything above the cost of production. This has tended to make the existence of the small operator, especially, a precarious one.

It is obvious that, to complete the operation and make the business successful, some means must be found to market the product at a profit to the producer. Many methods have been tried with varying degrees of success, but it has been found that personal solicitation is the most efficient.

It has been most truthfully said that the markets of the world are builded on salesmanship and that our great commercial institutions are monuments to the genius of salesmanship. If you will make a list of the great industrial organizations of America, whose names one might say are synonyms for success, and study their development, it will be found that almost without exception they have been able to create a demand for their product or supply a demand that already existed, which would absorb their output at a substantial profit. This ability is without doubt the most important factor in their success. No business institution can prosper or long survive if unable to market its product at a profit. The failure of so many of our business enterprises, if the cause was known, could in the majority of cases be traced to poor salesmanship or the poor merchandising of their product. Sheldon defines salesmanship as "the power to persuade people to purchase at a profit."

The marketing of lumber is in many respects different from the marketing of many other commodities. Unlike most manufactured products, which bear little or no resemblence to the raw material, lumber is unchanged except as to form and size; the character or properties of the wood are unchanged; the lumber is an integral part of the tree and, except for the removal of defects in manufacture and the change in form or size, is as nature produced it. The marketing should begin with the cutting of the tree and all operations should be so harmonized that when the finished product is placed on the market it will supply the demand for those sizes and grades which will command the highest price.

The sizes of lumber are determined largely by the size of the timber itself and the market which the producer seeks to supply, also the uses to which the particular wood is adapted. Custom and the adoption of standard sizes in many industries using lumber regulate very largely the sizes which the manufacturer must produce. The demand for lumber comes from many sources and, to supply the demand, from the same log the manufacturer must produce sizes and grades which in his judgment can be marketed to the best advantage. The real science of the manufacture of lumber is the ability to take from the log the highest quality and the greatest quantity of merchantable lumber which when sold will net the greatest return. To be able to anticipate what class of lumber will be in demand and to cut stock to supply that demand is very important, but at best can only be a guess. Constant study of the markets, coupled with experience of the past and information showing the normal consumption of certain sizes and grades, is the basis on which the producer should figure. To be able to supply what is in demand is, of course, of inestimable value to the salesman. It must be borne in mind, however, that the character of and the defects in the timber to a large extent control the grades that can be produced.

In the production and marketing of lumber there are always certain sizes and grades that are in demand, while others are always produced in excess of the demand. Much of the log cannot be marketed at the cost of production and the profits from the operation must come from the higher grades, as practically all the lower grades are marketed at a loss. **The problem, then is to market the entire product of the log so that, when taken as a whole, it will return a profit.**

To be a **real salesman,** one who can market his stock to advantage, a man should have a fair knowledge of the timber from which the lumber is produced. He should know its defects, its outstanding qualities and characteristics which for certain uses make it preeminent. He should be familiar with the merits and defects of competing woods, so that he may make comparisons as to the values and utility. He should know what the timber will produce, the process of manufacture and from what part of the log each grade is taken. With a definite knowledge of what the log will produce, he will not sell or offer for sale items which are impractical, unprofitable, or, sometimes, impossible to produce. Frequently, salesmen take orders for items which are almost unobtainable.

A salesman should be familiar with the shipping and drying problems and the operations in the planing mill, also the rough and dressed sizes of all of the product. He should know the general office routine in handling orders. Perhaps the knowledge that will be of the greatest use to him is this: He must know the **grades** of lumber thoroughly, not a smattering of them, but a well grounded and thorough knowledge of the grades and the grade structure. This is an invaluable asset. Equipped with this knowledge, he knows instantly what grade to supply for any given purpose where his product can be used to advantage—he is in a position to advise and to be of real service to his customers. **You cannot know too much about your product, and "Knowledge is Power!"**

An outline of the training necessary to equip a man with sufficient knowledge to market lumber successfully would include:

> Sufficient time in the woods to become familiar with the timber.
>
> A few months in the mills studying the logs and the process of manufacture.
>
> Sufficient time in the yards and planing mill to acquaint himself with these operations—and
>
> Plenty of time with a good grader, to became thoroughly familiar with the grades.

This, with a study of stocks and the requirements of the different classes of consumers, should equip anyone with the information necessary to sell lumber. A salesman should have at least a high school education and the added advantage of college training should be of decided benefit to him but, after all is said, WORK is the great essential to success! Though endowed with all other qualifications, lacking this, failure is certain.

There is much difference of opinion relative to the training and qualifications of a lumber salesman. These are hard to define; there are many, and possibly no salesman has them all. Generally speaking, manufacturers prefer men who have had some experience in all branches of the industry. One of our old philosophers has said: "Know thyself;" this is well, but, for the successful salesman, let us add "KNOW THE GOODS!"

The salesman is the connecting link between the producer and consumer. He is an ambassador representing the producer at the court of the consumer. How important it is, then, that he shall represent his concern truthfully! There are few occupations open to men with little or no capital where there are greater opportunities, where returns are surer, or where ability is more quickly recognized, than in the selling of goods—and lumber is no exception to the rule.

We read that "faith will move mountains." Literally, it is doing so today. We accomplish nothing without **faith**. The salesman must have faith in himself, faith in his concern, faith in the product he sells. Without faith he lacks confidence in himself and cannot hope to convince others.

**Enthusiasm** is a force so potent that its influence can scarcely be measured. The ardent, enthusiastic salesman compels attention, creates a like enthusiasm in his customer and is irresistible. Enthusiasm is contagious and no serum yet discovered can prevent its spread if one is thoroughly inoculated with the germ.

**Be earnest.** You must put your whole heart into successful selling. The earnest, intelligent, enthusiastic salesman inspires all with whom he comes in contact. Follow literally the divine injunction: "Whatsoever thy hand findeth to do, do it with all thy might."

**Be positive.** The positive salesman is convincing. The impression he conveys is that he is sure, he is certain, he **knows**. You cannot hope to convince another unless you, yourself, are sure and positive. **Know.** Don't guess.

**Be diplomatic.** Don't antagonize. Diplomacy is a wonderful asset, not only in selling, but in all walks of life; it is worth much study and cultivation.

**Be sincere** and **tell the truth.** Sincerity creates confidence, and no buyer places many orders with the salesman in whom he lacks confidence.

Do not attempt to sell goods about which you cannot tell the truth, for failure is inevitable and success impossible.

More and more, we are coming to the realization that the best text book on business today is the Bible. The great truths it teaches and the principles it prescribes are those which must govern and mold the conduct of any business institution if it is to be permanent. Most of the modern business maxims and slogans are but these old truths rewritten.

We hear so much these days about **service**, that great principle which is the foundation of successful merchandising; there are many who preach, but few who practice. "He profits most who **serves** best."

When you can be of real **service** to your customers; when you can assist them; when your knowledge and experience are at their disposal; when you have convinced them that you are interested in their welfare and success, then your selling problem is simple —you have learned how to **serve,** and your success is assured.

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**Think It Over:** I have never heard a thing about the resolution of the apostles, but a great deal about their acts.

# Opportunities Existing in Indian Service

**By J. P. KINNEY, Chief Forester United States Indian Service**

Extensive logging operations have been conducted on lands held by the American Indians in Minnesota and Wisconsin since the early part of the last quarter of the nineteenth century and restricted operations were conducted on allotments of western Washington and Oregon in the closing years of that century and the early years of the twentieth century. However, these operations were largely directed to the relief of immediate needs of the Indians and there was no effective general organization of the work and no well defined policy of the Department of the Interior either as to the utilization or the protection of forest property. The administration of the Indian timber resources was left almost entirely to the initiative and discretion of local superintendents. Where the superintendents were capable and alert creditable results were attained; where they were incompetent or indifferent the logging operations contributed chiefly to the financial advantage of those who secured the privilege of purchasing timber from the Indians. As the Congress provided no special fund for the prevention and detection of trespass or for the prevention and suppression of forest fire, very substantial losses were sustained on many reservations.

The first special appropriation for forestry work in the Indian Service was secured in the Indian appropriation act for the fiscal year 1910. A part of this appropriation was expended for fire protection and timber examination during the summer and autumn of 1909. Early in the calendar year 1910 the forestry work in the Indian Service was given the status of a separate unit and the organization of the forestry branch of the Indian Service was begun.

It has been the purpose of the forestry branch to bring to bear upon the administration of Indian timberlands the salient features of scientific forestry practice without serious interference with the economic interests of the Indians as the owners of private property. The maintenance of this attitude has imposed upon those engaged in forestry work in the Indian Service a task comparable to that which must be assumed by a forester who undertakes to administer the forest property of an individual or a private corporation in such manner as to secure the highest possible money return to the owner without serious injury to the public interest, either present or prospective. Little emphasis has been placed upon the purely investigative phases of forestry, since this function belongs logically to the Forestry Bureau in the Department of Agriculture, but the Forestry Branch in the Indian Service has had rather exceptional opportunity to observe and study the practical phases of timber utilization. Several government logging and milling enterprises have been conducted under the supervision of the Service and one logging and milling operation of this character on the Menominee Reservation in Wisconsin has manufactured and sold approximately 20,000,000 feet of timber products each year since 1909.

The Indian timberlands comprise an area of approximately 7,000,000 acres and the stand of timber thereon is valued at more than $80,000,000. While the amount expended for fire suppression has never exceeded one-half cent per acre on the total area administered, the protection afforded has been such that the relative damage to merchantable timber and young growth has quite certainly not been greater than that on private lands, or government lands administered by other Federal bureaus. It may possibly be conceded that the risk as to fires set through carelessness is somewhat less on most Indian reservation lands than on National Forests or other public lands. A vigorous policy regarding timber trespass on Indian lands has practically eliminated this source of loss and the Service has given serious attention to efforts directed to the elimination of losses from insect infestations.

In recent years this branch has given special attention to the making of valuation surveys and the effecting of large timber sales as a means of obtaining the funds necessary for the initiation and support of plans for the industrial advancement of the Indians. The valuation surveys are made with great care. Controlling base lines are run with a transit and the elevation of the various stations related to points of known elevation. A 20 percent cruise is ordinarily obtained by the running of two compass lines through each 40 acre tract. Measurements are made by chain tapes and elevation along the compass courses are determined by Abney hand levels. From such an examination a satisfactory estimate of the timber is obtained and data secured for reliable land classification and for the preparation of excellent contour maps. The information thus obtained is used in the determination of the terms and conditions on which timber shall be offered for sale but those engaged in working up offerings of timber are always advised to give due weight to local or unusual market conditions and to the general indicia of values which may be "sensed" from the general atmosphere of the locality. Timber appraisals that are based solely upon "accepted formulae" and mathematical calculations by the inexperienced are often less reliable than the seemingly "unsupported" judgment of the man that is not so charged with static conviction as to repel any current of the general field that tends to flow toward him.

A young man entering the Forestry Branch of the Indian Service may be assigned to forest protection—a task that requires enthusiasm and a determination of purpose; he may be assigned to the cruising of timber—a work that may become monotonous and irritating to the man that is not sustained by ideals; or he may be assigned to timber sale administration—a job that requires continuous application to detail, more or less petty. If a man has not the final purpose, the idealism and the work-habit that will carry him through the disappointments, disillusionments and doubts that are sure to beset him along his pathway, he will not succeed in forestry work in the Indian Service. If he has the true spirit of a forester and a sympathetic interest in the things that make for the social and economic progress of a peculiarly distinctive element of our complex population, he can almost certainly advance from a place of minor responsibility and irksome detail to one in which he shall have a large part in the carrying forward of a work that has brought to the Indian an income of practically $1,500,000 annually for a decade and is destined to play no small part in the future progress of the redman and in the solution of the forestry problem in America.

# Mastering Difficulties Engineer's Problem

**By GEORGE M. CORNWALL, Editor The Timberman**

I have always had a most profound respect for the opinion of General George W. Goethals, the builder of the Panama Canal. I suppose we all have a great admiration for men who agree with us in our ideas.

In a recent and a very readable article in the January number of The American magazine, there is an interview with General Goethals which every young logging engineer should read. It is worth while. The simplicity and directness of attack of any problem which had to be undertaken by General Goethals is illustrated in his reference to a bridge he was directed to rebuild in a hurry at Spokane in 1882 in the then territory of Washington. It seems a freshet had carried away the bridge which was the only means of easy access to Port Spokane, and in those days the War Department built the bridges in the Territories. Goethals had never built a bridge. "This did not matter," he said, in speaking of this bridge building work. "I read books all night and gave orders all day. However, we built the bridge and on time. Those were the orders and were followed."

No incident could more clearly represent the dominant thought in overcoming obstacles than this single incident. It is a whole chapter in itself in pointing the way to overcome difficulties. It is just the way the average logging engineer should tackle any work to be done. Go to it and do it.

Again referring to General Goethals, he said: "The man who is entitled to the most credit is the man who does something, no matter how crudely, for the first time. Those who come after him are directors or administrators, not originators." This is the creed of the logging engineer.

A case in point: During the late war the Smith-Powers Logging Co. of Powers, Oregon, was helping get out logs to be used in war material. A donkey engine had given out, perched on the top of a hill several hundred feet in the air, located in a very strategic position. The suspension of work by this donkey would have held up the particular unit of the organization. It seems the direct cause of the difficulty was leaky tubes. However, it was found essential that pneumatic tools be employed by the boiler maker in making the repairs. To remove the donkey from the hill and take it to the machine shop would have required about 60 hours. Time was pretty precious these days. Fred W. Powers, the very efficient logging engineer, who with his good father bosses the job of getting out the logs at the Smith-Powers camps, was called in to learn what might be done to facilitate repairs. Fred came on the job calm and collected. He heard what the donkey engineer had to say; got in touch with the "donkey doctor" and stated the nature of the repairs required. The "donkey doctor" said if it were possible to get air for the boiler maker's pneumatic tools at that particular spot on the earth's surface, it would only require a few hours to make the repairs. This sounded simple enough, but where was the supply of air to come from? It was five miles from the machine shop. Fred Powers asked the foreman what shape the water line was in which supplied water for this particular engine. He learned the line had been down some two years and was therefore fairly tight through corrosion. He then inquired where the nearest point on the railroad the Shay locomotive could be spotted. He was advised some 1800 or 2000 feet distant, if I remember correctly. All this time the foreman and engineer were scratching their heads as to what direct relationship a water main and a Shay locomotive had to do with the problem of delivering air to this particular donkey. They soon learned. Fred asked that a section of the pipe line be disconnected and plugged, and a tee inserted and a hose connected from the air pump to the pipe line. The air was delivered to the "donkey doctor" early Sunday morning, permitting the repairs to be made in a few hours.

This is what may be called the essence of high engineering skill that wins distinction. It is, as General Goethals says, the worth while man who does something for the first time with only his brain and rude tools with which to perform the work. It is the small things which really count in life in helping get big things done. General Goethals said if Doctor Gorgas had not been able to successfully combat the mosquito in Panama the work would have been much more difficult of accomplishment and long delayed. De Lesseps, the great French engineer who built the Suez Canal, failed at Panama as he could not successfully combat the toll of death imposed by the mosquito.

These fever carriers swept away De Lesseps' men like a plague. De Lesseps probably did not calculate the cause of the malady. Goethals understood and Doctor Gorgas did the job. The same lesson in sanitation holds good in the operation of a logging camp. Clean, healthful surroundings are the first essential to success in any operation.

"No system of training," Goethals says, "will carry an incapable or unfaithful man to success. The world today is above all else a practical world, and it demands results. What it is looking for is men who can and will do things. And they cannot do things unless they try."

This reminds me of another incident in logging engineering which came to my attention, and illustrates General Goethals' ideas so splendidly.

Up in British Columbia there was a little "hay wire" outfit logging on a steep hillside, for which British Columbia is famed. Only one engine was employed and it got away and rolled down the hill into the river, which was in a freshet stage. The fire box was under water and the engine on her side, with drums tilted upward. It looked like a pretty hopeless task to rescue the donkey and get her back up the hill. The hook tender threw up his hands and the crew was pretty well discouraged. The foreman was a man of nerve and a natural born engineer. The game did look pretty hopeless. He lighted a cigarette, took a cinch in his belt and said:

"Boys, she has got to come out and we can do it. Go ahead and make fast a line to that tree and carry it back and hitch it to the front end of the donkey. Haul it as tight as you can." This was done, but the light of understanding did not yet glint across the minds of the boys as to how a purchase was to be applied which would salvage the donkey.

"Wait a minute! Hey, you fellows, see

these trees within reach of that line? Go ahead and fall them over the line and 'jump' her into position." Several trees were felled and some progress was made in getting the engine on an even keel. But one line would not do the trick. Another line was made fast to a tree and carried back to the donkey. More trees were felled and the engine kedged into position so steam could be gotten up. In a short time old "Betsy" steamed up the hill and the camp resumed operations as if nothing had happened. This is the sort of thing which makes you feel like taking off your hat to the man who in the face of seemingly insurmountable difficulties digs in—masters them and comes out on top.

As General Goethals says, "The best man is the one who regards each difficulty overcome as in the nature of an educational degree. He is willing to try anything! And he finds that his troubles steadily lessen. until eventually he is equipped to do with ease what might have been impossible for him only a few years before." To the young man who is taking a course in logging engineering let him ever keep before him the fact that he must equip himself with all the knowledge he can acquire at college. Much of the work in the course may seem unnecessary and even perhaps foolish to his mind, but when you engage in your actual life's work, you will find that your courses were well planned and essential in every particular. "Nothing is ever as hard as it seems to be," says General Goethals. "There is always a way out and commonly a very simple way. A big task usually reduces to small and fairly simple elements, if only it is calmly and fearlessly attacked. And if one attacks with the firm feeling that whatever is in the way must be overcome, then it will be overcome." I could go on pretty nearly indefinitely and recite case after case where the logger overcame his difficulties and proved himself superior. One more and I am done.

In a British Columbia camp, situated some 150 miles from Vancouver, it was found necessary to re-tire a locomotive. The problem of getting the engine on a barge and towing it to Vancouver negotiating rough water was not a very safe expedition to undertake.

The foreman said he felt it would be impossible to replace the tires at the camp. His master mechanic was not a bad mechanic but had little initiative. He shook his head rather gloomily and mildly protested the job could not be done, if at all, not very successfully. The foreman said:

"Go up to the cook house and get the spare hot water tank the cook is not using, and bring it down to the round house." This was done. The tank was filled with about equal parts of water and gasoline. Two pieces of pipe with valves were screwed into the side of the tank at the top and bottom. To the lower connection a piece of hose was attached to the air pump on the locomotive. A piece of black pipe shaped to conform to the circumference of the wheel, was secured. Holes were bored on the inside of the pipe, and a second hose line connected with the upper connection in the tank. By starting up the air pump the mixture was agitated, forced through the connection into the punctured circular pipe line which surrounded the wheel to be removed. The mixture of gasoline and water was ignited. The wheel was heated, expanded and removed within a very short space of time. The new wheel was similarly heated and replaced the old one.

The recital of these three experiences only emphasizes what has already been said about being prepared to meet emergencies.

As to your last question as to what particular course should be studied in order to fit a young man for the logging engineering profession, would say briefly:

First: Good working knowledge of the English language.

Second: The ability to accurately estimate costs.

Third: Knowledge of mathematics and surveying.

Fourth: Sufficient time spent in the woods each summer, so the embryo engineer may "know men" and how to rub along with them.

Fifth: A good working knowledge of the rudiments of steam, electricity, hydraulics and internal gasoline engine practice.

Sixth: Railroad and bridge construction.

Seventh: How to make and read a blue print.

Eighth: Learn to take orders and carry them out without debate. Keep a quiet tongue. Respect the men above and around you. Learn whenever you can, be it night or day. Don't shirk. Be a winner.

Take a five-year course in preference to a four-year course.

If you are short of funds to complete your education, better work in the woods several summers and continue your studies over a longer period than attempt to crowd into too limited a time the necessary preparation for your life's work.

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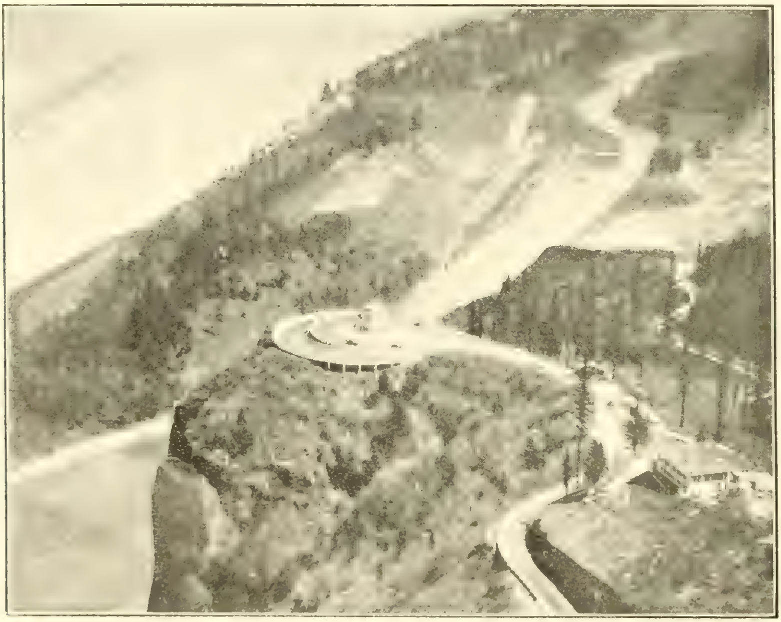
**Think It Over:** Doing is the great thing. For if, resolutely, people do what is right, in time they come to like doing it.

# Technical Man Is Essential to Industry

### By HENRY S. GRAVES

One of the interesting developments of recent years has been the public recognition of the engineering professions. There was a time when many people looked upon the engineer as an impractical theorist. Rough-and-ready methods and rules of thumb were sufficient "for all practical purposes" in construction work. Why should it be necessary in building a road to use instruments and to make mathematical calculations, maps, blueprints, etc.? Were there not practical men who by the eye could unerringly lay out the grade for a road, or construct a timber bridge that would last a lifetime?



VISTA HOUSE ON COLUMBIA RIVER HIGHWAY OVERLOOKS THE MIGHTY COLUMBIA

This was of course a relic of the point of view of the frontier. In the first development of a new country crude methods are essential. The first need is to open up the country and make it accessible. The population is scattered, the traffic over roads and bridges is small. Temporary structures suffice for first needs. Natural resources are so abundant that wasteful methods can be used without public loss.

The engineer brought a new viewpoint. He sought to lay foundations for a permanent development. He had a vision of a greater service that would be required of the works which he built. He saw opportunities for creative undertakings that would contribute to the development of the country in ways impossible by the "one-team" methods of the frontier; and for such a development there were required not only the technical methods of modern engineering but the vision and constructive ability of the well-trained engineer. He proved by his works the soundness of his theories. He has earned a rightful place in public confidence and esteem.

In this struggle for the introduction of new methods and a new viewpoint, one of the greatest factors of success was the technical engineering school. There was great pressure upon the practical engineers to continue old methods and to get along with old-fashioned standards, but the schools held steadfast to high ideals and insisted upon the best technical training. The progress of engineering in all its different branches in this country is due primarily to the existence of highly-trained men, who in the largest sense have contributed to the building up of our country in may different directions.

We find in the history of engineering many points of similarity to the history of forestry. We, too, have had to begin with frontier methods, to use rules of thumb in our forest work, to employ crude methods of forestry often not differing greatly from those of ordinary lumbering. At the beginning, the American forester faced indifference, ridicule, and often opposition. Even today he is frequently called impractical and a faddist. The greatest pressure is brought upon the field forester to lower his standards of practice with the idea that economic conditions prevent a real practice of forestry. In some instances, forest schools are urged to subordinate in their training those branches of the subject which superficially appear of less importance in the first work of the forester.

The forester has to look forward many years. The consequences of mistakes in the management of a forest may not appear immediately. The field forester is frequently urged to use methods which would result in the deterioration of the forest. It is of course possible to undertake changes too rapidly. It may take time to overcome existing obstacles to refined methods of practice, but the forester who yields his ideals under such circumstances and who loses faith in forestry has failed in his profession. We must look to the forest schools as the strongest agencies for maintaining high standards of practice. This applies not only to the giving of good technical training and instilling in the students a right point of view, but also to the influence which the forest schools may exert upon the practicing profession.

We are entering a new era in forestry. This is in part due to the fact that the first foundations have been laid and that we are now in a position to undertake steps heretofore impossible. More important, however, is the fact that the depletion of our forests has already progressed to a point demanding a more effective and more extended practice of forestry. Already we are beginning to use more accurate methods of measuring and grading the products of the forest, better standards of manufacture, better means of handling and seasoning wood, and a more intensive practice of silviculture. It is the technically-trained men who are leading in this change and are placing forestry upon the plane of modern engineering. Just as the engineer by the demonstration of his ability won public recognition, so the technical foresters are more and more looked to by private industries as well as public institutions to handle work which requires new and better methods of practice.

Frequently the student is inclined to measure the work of his chosen profession by the standards which he sees in actual practice and he may find irksome the training in science and engineering which appears to him unessential under American conditions. It is the duty of the forest schools to insist upon the highest standards of technical training, if the graduates are to be competent leaders in building American forestry, and not mere routine technicalities. The men who will be in the forefront of the profession will be those who are thoroughly well grounded in the science of forestry, who have a grasp of its economic aspects, who have a vision of what may be accomplished, who have courage, initiative, and persistence, and who have real faith in forestry and its ideals.

It is a gratification that forestry is increasingly being given recognition. Every day our profession is gaining in public confidence and respect. Upon the work of our forest schools will largely depend the progress of the science, and the extent and the character of forestry practice.

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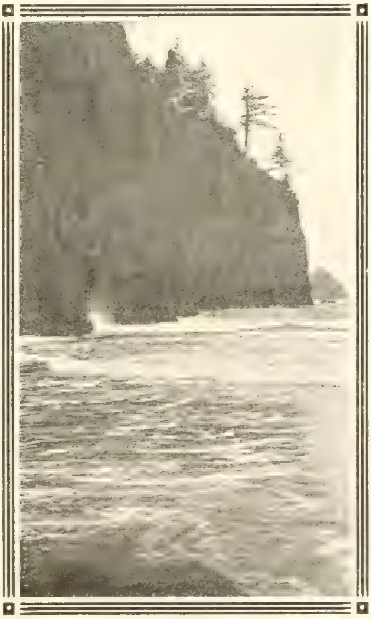
**Think It Over:** On the wall of one of the most successful of executives and actionmen is this single motto: "Do It Now."



# Natural Reforestation Through Migration

By DR. J. V. HOFMANN, Director of Wind River Forest Experiment Station, United States Forest Service

The presence of Douglas fir throughout the Pacific Northwest is evidence that at some time in the past it has reached the various sections through migration. Since it has reached all nooks and corners suitable for its growth, it would appear that migration no longer plays an important role in the life history of the Douglas fir forest in this region. The forester, in his efforts to perpetuate the Douglas fir forests, however, could make no greater mistake than to ignore the factors that effect migration.

If a forest of Douglas fir is to be retained on an area, it is essential to know what method of handling the present stand will insure its perpetuation, or if it is not found at present, it is necessary to aid nature in stocking the area. In either of these instances the question of how fast Douglas fir will migrate is an all important one.

The extensive and thrifty stands of young growth of Douglas fir that occur throughout the Pacific northwest are evidence of the ability of the Douglas fir to perpetuate itself and keep possession of areas under ordinary conditions. The areas covered with young growth are pleasing to the eye of the tourist; form pleasant surroundings for the camper and are the pride of the forester who realizes that they are a present day asset, in that the land that the young growth occupies is productive and has a present value as well as providing for a future lumber cut. Contrasted to these productive areas are the barren, burned wastes throughout the region that have given the term "timber devastation" a meaning to the layman and forester alike.

Areas devoid of all tree growth vary from blackened, burned areas to fields of ferns and firewood or a tangled mass of brush, depending upon the length of time since tree growth was destroyed by careless burning.

The reclamation through natural means of area denuded of trees is possible only through migration and each condition presents different phases of its progress.

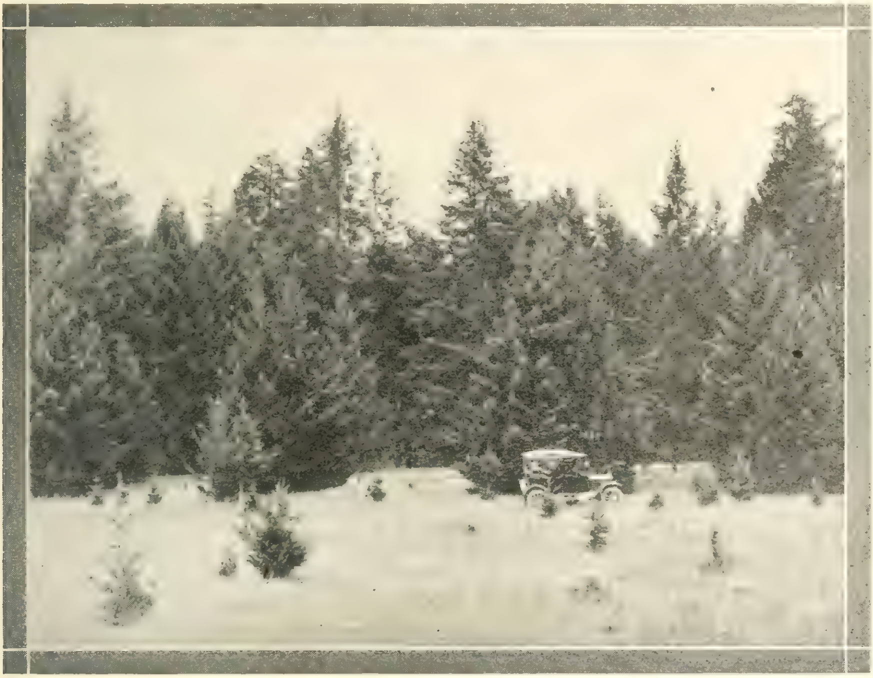
## Forest Claims Prairie Region

Where a forest advances into a region that has not previously been occupied by a forest cover its advancement, if left undisturbed, progresses in exact proportion to its ability to migrate. Almost invariably there are other factors, such as soil and climatic conditions, fire and interference by man or animals, that retard its progress but, in the main, the species that is best able to distribute its progeny beyond the reach of its associates is the one that gains possession of the area.

Migration of Douglas fir is a very slow process. Large, level areas south of Tacoma, Washington, known as the Steilacoom Plains, have not been covered with forest stands during the past few hundred years, and it is possible that these areas have never been covered by forest growth. The only apparent reason the forests do not now cover this region is that the young growth has been consistently destroyed by fire. The areas were probably quite regularly burned over by the Indians or possibly by fires caused by other agents. That the forests were held back by some foreign agent is evident from the progress that the forest is now making in taking possession of these plains.

Establishment conditions are, on the whole, rather unfavorable, but occasional seedlings become established within seeding distance of the forest. The definite limits of age classes from seed-producing timber are conclusive evidence that the forest is moving out into the prairie by steps rather than a gradual process. Each forward movement of 3 to 5 and, in some instances, 10 chains, contain age classes from 1 to probably 20 or 25 years old. The advance seedlings beyond this strip are so rare that they can hardly be considered in the migration of the forest. It is evident that when these advance strips reach seeding age the forest is ready to advance another strip of about the same width. After trees become established the forest floor soon takes on the nature of a typical Douglas fir forest and forest conditions are established.

Usually a forest of this type of migration is in such strong contrast with the stands of young growth that are found in most of the Douglas fir region in the Pacific Northwest that the source of seed from which the stands originate is evidently different. The first forest that invades this prairie region consists of a very uneven-aged stand containing trees from 1 to 40 years of age. The second forest following in this same region after the mature forest is destroyed is the typical even-aged stand of Douglas fir young growth found throughout the region. The definite migration on this prairie region is a clear demonstration of what may be expected when a Douglas fir forest is reduced to an absolute migration process and also throws doubt upon the young growth appearing erratically in large burned areas even where the apparent source of seed is the remaining green timber around the edges of the burn. The arid conditions of these plains reduces the possible number of seedlings that succeed, but the proportion of age classes at different distances from the timber show the ratio of seeding because establishment conditions are equal at these various distances.



DOUGLAS FIR MIGRATION INTO PRAIRIE

Old timber in background, 4 to 30 years old in middle, 1 to 10 years old in foreground. Seedlings at greatest distance from timber are 5 chains from mature timber and 30 chains from 30 year old class.

In localities where moisture and soil conditions are more favorable such as some sections of the Willamette Valley in Oregon, the forest makes more substantial progress through migration by a greater percentage of establishment of seedlings. The distance of each seeding generation, however, is not materially increased.

## Dense Stands of Douglas Fir Young Growth Follow Forest Fires

In contrast to the advancement of the Douglas fir forest by migration are the extensive areas of even-aged young growth, in some instances covering a quarter of a million acres, that have followed immediately after forest fires. The appearance of such stands, obviously, cannot be due to migration. What then is the source of such vast areas of young growth?

The answer has been found through a long period of research. It was found that the greater per cent of young growth in the Douglas fir region springs from seed that was stored in the forest floor, or in cones, previous to the destruction of the forest and which retained its viability through the fire and germinated soon after the removal of the forest. Such stands, consequently, are due, not to migration, but to succession.

A succession usually results in the reestablishment of the same formation that existed previous to the disturbing or destroying agencies. An immediate succession without the characteristic presence of the intermediate stages results either from dormant seed left after the removal of the previous formation or from exceptionally favorable conditions for reseeding. Immediate succession is the typical and characteristic formation in the burns in the forest region of the Pacific Northwest. In successions of this character the forest which was removed by fire, cutting or other agencies is replaced by the identical species of the original forest, although usually in different proportions.

The immediate successions in the large burns of this region are not due to distribution of seed from trees left after the fire, as shown by the stands of reproduction that occur regardless of distance from seed trees and, in many instances, species are being replaced in such burns where no green trees of the species were left after the fire. More important is the fact that, wherever the reproduction of some species was found coming in after a fire which had killed the entire forest, the dead trees and snags of that species were always found in the locality of the reproduction. Charred cones, cone scales and seeds of all of the species killed on a burned area were usually found on the area after the fire but no unburned cones or seeds, although perfect seeds with wings were found in the unburned duff on the burned areas.

## Douglas Fir Crowded Out of Stand

The Douglas fir forest cannot compete with the western red cedar and western hemlock when these species occupy the same ground. Although the Douglas fir produces greater height growth, the western red cedar and western hemlock form an understory which precludes the replacement of Douglas fir by its own progeny.

As the Douglas fir trees mature or are killed out of the forest by any agent other than fire, and the western red cedar and western hemlock remain uninjured, the opening made by the removal of the Douglas fir is immediately taken by the understory of western red cedar and western hemlock. For this reason a Douglas fir forest very seldom maintains a pure stand past the first generation, and instances have been noted where the forest was entirely replaced at the end of the first generation. Stands of Douglas fir 50 years of age with very clear, straight boles and well-developed crowns sometimes have a complete understory of western red cedar and western hemlock of practically the same age. While the Douglas fir may be 100 to 130 feet tall, the western red cedar and western hemlock understory is only 20 to 30 feet. This understory is not suppressed beyond recovery; consequently as soon as the forest is opened the growth increases and eventually forms the forest stand. Even though there may be a number of veteran Douglas firs in a forest consisting mostly of western red cedar and western hemlock, there is no chance for the replacement of Douglas fir unless the entire forest is removed. Overmature Douglas fir trees, especially in a forest stand, produce very little seed. The Douglas fir seed is the favorite food of rodents, with the result that it is gathered and, if the supply is greater than the demand for food, it is stored in the forest floor. In this

THE STAGE BEFORE A COMPLETE FOREST STAND
Scattered stand of Douglas fir 12 to 25 years old due to migration. Two to five year old seedlings are coming in among this stand.

way the rodents may either prevent restocking by using all of the seed, or materially assist it by planting seed. Conditions have been noted where the original stands contained only about 5 percent of Douglas fir, and the young growth contained as high as 50 percent after a fire.

DENSE STANDS FOLLOW FOREST FIRES

A dense, even-aged stand of thousands of acres of Douglas fir young growth due to succession after a forest fire.

The Douglas fir forests of Oregon and Washington usually have a sparse to dense stand of undergrowth of herbs, shrubs, and trees. The density of the stand varies in accordance with the completeness of the stand of Douglas fir. A dense stand of young growth of Douglas fir usually succeeds in crowding out all competitors. The competition with other species is more keen in the open areas and in some localities the Douglas fir is unable to compete successfully with other species in succession and regains the area only by a slow process of invasion if it is able to do so at all. In competition one species drives the other back, and the victorious one is that one which can best utilize the given combinations of soil, light, moisture, temperature, etc. In localities where the Douglas fir occupied the south exposures and the ridges it is not because it prefers those soils or localities but because it is expelled from the deep loam and moist soils by the western red cedar and western hemlocks.

Where the Douglas fir forests are delimited from the forests of western red cedar and western hemlock it is not a question of inability to thrive at the boundaries. In the middle of the favorable area the species makes no selection as to soil, but outside of this central position it is forced by other species to exercise a choice. The Douglas fir forests continue to crowd the western red cedar and western hemlock largely because of the ability of the Douglas fir to establish its seedlings during the first season of growth. Its superiority over the western red cedar and western hemlock is due to the larger seed, and the consequent amount of stored food in the seed, which enables the seedling to send down a much deeper root system earlier in its development.

If the enormous quantities of seed produced almost annually by the western red cedar and western hemlock had the same chances of succeeding as the Douglas fir, soon the entire forest would consist of these species. The small seeds produced by the western red cedar and western hemlock results in very shallow-rooted seedlings during the first season, and this factor alone is very important in keeping these species from any but favorable, moist sites. Seedlings of these species must have two or three favorable seasons in order to become established sufficiently to insure them against the drought period.

## Young Growth Following Logging

Dense stands of young growth occur in unburned slash on areas where no seed trees are left. The young growth consists largely of western red cedar and western hemlock and contains less of the other species that were in the stand before cutting. The vegetable matter and soil of the forest floor contain the stored seed of all of the species that form the stand and those seeds that are not destroyed by fire germinate and form the new forest. In unburned slash the new forest usually contains a larger per cent of western red cedar and western hemlock because more of the seed of these small-seeded species is near the surface.

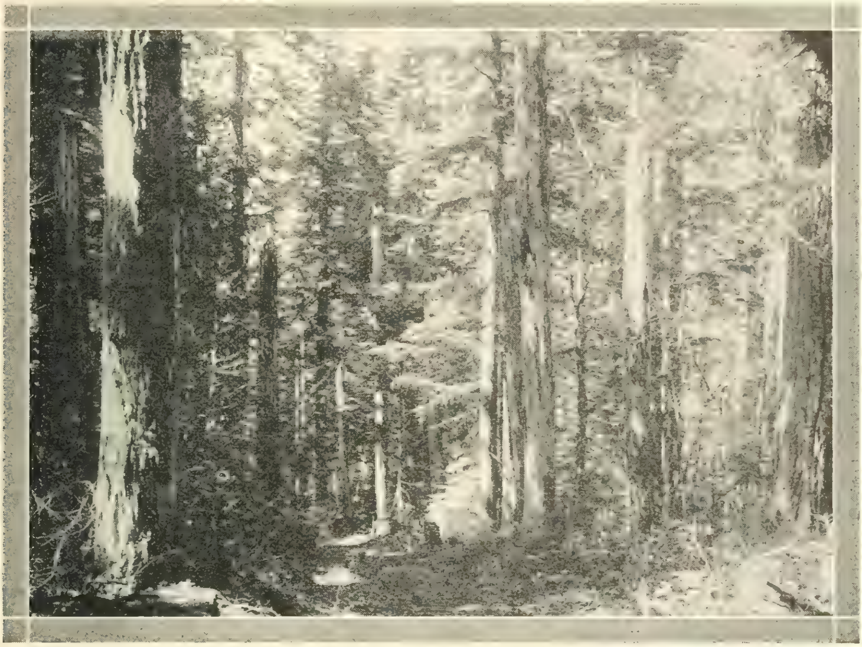
RAPID REPRODUCTION ACHIEVED THROUGH SLASH BURNING
A complete stand of thrifty even-aged young growth of Douglas fir due to succession after clear cutting and slash burning.

The large amount of debris left after logging in the Pacific northwest makes a very dangerous fire risk and necessitates burning of the slash in order to protect the surrounding forests and nearby property. This fire risk should be removed at the earliest opportunity and it is necessary from the forester's standpoint also, that it be burned during the first season after cutting. The heavy slash left after cutting a mature Douglas fir forest makes broadcast burning imperative. When a broadcast slash fire runs over an area it may effect the succeeding young growth in various ways. It may burn only the surface layer of litter and duff and leave conditions favorable for a good stand of young growth with Douglas fir predominating, or all of the duff may be consumed and a scattered stand of young growth result except in localities of very loose soil where there may be a good supply of seed in the soil, or if the fire is hot enough to heat the mineral soil below the duff a barren area may result.

The heating of the soil is the important point and this can be controlled only by proper slash burning. In the spring the soil and duff are wet and the least heating occurs and the successful stand of young growth following spring burning, as compared to burning in summer or fall, are evidences of the desirability of burning the slash in the spring. Fall burning may sometimes approximate spring conditions, but usually it is too wet to burn after the forest floor has become wet enough to protect the seed.

On areas burned more than once the possibility of a few dormant seeds still remains, which may account for some fairly good stands at considerable distances from seed trees. The distribution of seed by wind and birds is also a factor which, combined with favorable establishment conditions, may result in a scattered stand in some localities, while others with less favorable establishment conditions remain barren.

The single seed tree evidently will not insure a complete stand for some time and it is doubtful if the stand would be complete until the seedlings reach seeding age and restock the remainder of the area. This gradual seeding of an area must not be overlooked in the protection of a scattered stand of seed trees or scattered young growth which in reality is a stand of potential seed trees.



WESTERN HEMLOCK CROWDS OUT DOUGLAS FIR

An over-mature forest of Douglas fir about 450 years old. Trees had reached a diameter at breast height of 3 to 5 feet and a height of about 225 feet. All snags in picture are dead Douglas firs and the ones showing good bark have died recently. The stand is completely replaced by western hemlock.

Although such trees produce good crops, the seeds are often entirely consumed by rodents due to the limited supply on the area.

### Application of Migration in Management

The foregoing discussion points out that the extensive stands of young growth of Douglas fir are due to succession and originate from seed that was within the area before the forest was destroyed, also that the process of migration is very slow in claiming an area previously unoccupied by the species or reclaiming an area from which it has been removed by fire or other agencies.

Why, then, must the forester consider migration in forest management? It is essential to know the limitations of migration and to recognize clearly that successful forestry practices must be built upon principles that will not allow the forest to be reduced to a migration process if the land is to be kept productive through natural means.

This is entirely possible under the present economic conditions and methods of utilization.

Clear cutting is the most feasible with the present system of logging and also produces the best results from a silvicultural standpoint. All trees and snags that remain standing through a slash fire should be cut regardless of whether they are merchantable or not, unless they are to be left as seed trees. A diameter limit would not be a satisfactory basis for classifying the material to be felled, because conditions vary widely in different localities or within the same area. The important point to accomplish is to fell all of this material before the slash fire. Trees up to about 12 inches in diameter at breast height usually are torn down by the cables where a large number of logs are skidded, but on the outer edge of the settings the logs are pulled out in more direct lines and a large per cent of such small trees remain after the logging is completed. This condition is the principal reason why a diameter limit would not solve the problem satisfactorily. Materials left standing after all operations are completed should be felled before the slash is burned. If trees and snags are left that will not be burned down by the slash fire, they form a future fire hazard that places the entire area in jeopardy and if any assurance for the safety of the area is desired it adds to the cost of fire protection. Standing trees are generally killed by slash fires and begin to fall a few years later, which creates a fire hazard among the young growth that may have followed after the first slash burn. Forestry practice will not permit the reburning of the area in order to remove this debris because the second fire on an area is more destructive to restocking than the first.

SPINDLING GROWTH IS AFTERMATH OF LOGGING

A scattered stand of Douglas fir seed trees left after logging. These have not been effective in restocking the area.

On some areas a large volume of unmerchantable Douglas fir remains, due to defect caused by disease. Unmerchantable Douglas fir trees should be left standing to serve as seed trees to assist in restocking the area and as a source of seed in case a second fire should occur on the area. There are scarcely any logging areas where the number of unmerchantable Douglas fir trees is large enough to interfere with restocking, if left standing.

For restocking from seed trees about two trees per acre should be left. Although some Douglas fir trees are windthrown when left standing singly, the loss is not common. If large merchantable trees are all that are available, the leaving of seed trees is prohibitive from a financial standpoint.

### Best Method of Slash Disposal

Conditions suitable for young growth after a forest fire are usually found in mature or overmature forests. The litter and duff form a deep layer on the forest floor and the cool, shaded situation under the forest provides favorable conditions for seed storage. When this type of stand is cut, the leaving of a large amount of debris after logging is inevitable.

Where the slash is burned with a broadcast burn immediately after logging and then followed by good fire protection, the land is generally restocked soon after cutting. This condition is often found in the Douglas fir region, and without any intent of restocking the cut-over lands about 40 per cent of the area out, that has not been utilized for agriculture or pasture, is now restocked with good young stands of Douglas fir. The more or less dense stands that follow after this method of cutting are very desirable because they produce the best form of trees both in the young stands and in the older forest.

In regions or localities where the fire risk is low enough to make it safe to leave slash unburned, this might be practiced. The practice would result in a preponderance of western red cedar and western hemlock in the young stands where these species made up an appreciable amount of the forest before cutting.

Nature has provided means for the perpetuation of the Douglas fir forest and it is fortunate that the methods of logging employed do not need to be materially changed to provide for the best means of natural restocking. Foresight is absolutely essential in the use of the methods of cutting and slash disposal but no changes from the best methods employed at present that involve additional cost are necessary. The burning of slash at a time that leaves the area in best condition for natural restocking, as stated previously, is also the best safeguard for the operator. By disposing of the slash immediately after logging, a fire risk, that endangers the logging camps and equipment, is removed; spring or late fall burnings give the geatest insurance against the spread of the fire to areas that are not ready to be fired or where damage would be done. Spring fires are not dangerous to surrounding timber or clean young stands, but must be kept away from open areas of older burns or the areas of young growth that contain inflammable debris.

Some of the important principles that form the basis for the practice of forestry in the Pacific northwest, in order to keep the land productive through natural means, may be briefly stated as follows:

1. The limited distance to which seed is distributed makes migration of the forest very slow, usually only a few chains each seeding generation.

2. Restocking of Douglas fir occurs naturally in this region if the forest is properly handled. The greater percent of young growth comes from seed stored in the forest floor, consequently it is necessary to protect this source of seed during logging and burning.

3. Clear cutting is the method used at present and it should continue to be practiced in order to obtain the best silvicultural conditions. All trees should be cut except those that are to be left as seed trees.

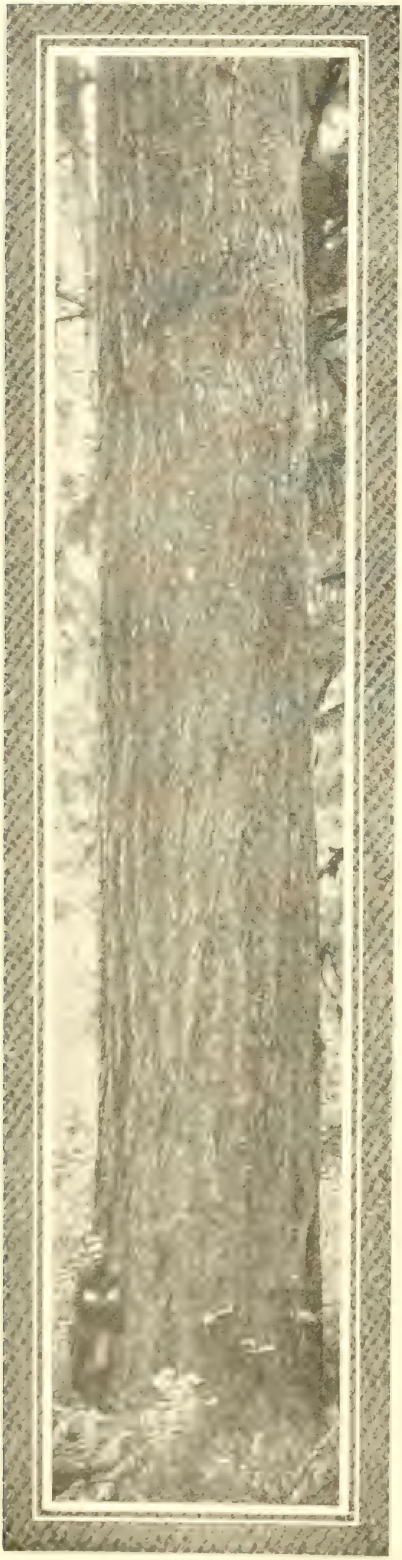
4. Where seed trees are depended upon to restock an area approximately two trees per acre should be left.

5. Slash must be burned immediately after logging in order to obtain the best conditions for natural restocking. Areas must not be reburned.

6. Spring burning of slash leaves the area in the best condition for natural restocking.

7. Where stands of young growth are destroyed by fire before they have reached seeding age restocking depends upon seed produced by remaining green timber of seeding age. Such conditions cause barren areas that are reclaimed by forest migration only after several seeding generations.

8. Succession in the Douglas fir forests depends upon conditions. Following a single forest fire in a mature forest or proper slash burning, succession is usually immediate from seed that was within the area before the fire.



# Amid the Ferns

"Those Forest School chaps are off on a spree,"
Said the Waldo Hall girls, as our trucks rolled by.
"They've prepared for a long one," said Mary McGee,
"They've got grub and bedding piled clear to the sky."
So we gave them a cheer as we rolled down the hill,
And soon left the city and college behind;
Two truck loads of huskies can sure raise a yell,
When they start on a prolonged spree of that kind.

When we reached Philomath, we stopped for a smoke;
And the Climax squad bought all the "chewin' " in town
By the time we pulled out we were nearly all broke,
For when we start shopping we do it up brown.
We soon reached the lane that leads up to Buck's,
Where a wagon and mule team awaited our gang,
And a few minutes later we piled off the trucks;
There the real trip began with a spurt and a bang.

Prof. Newins lead out with an engineer crew
To patch up the bridges where he felt the need,
And fill up the mud-holes we had to go through.
The rest of us followed—the Dean in the lead.
Then a bottomless bog stopped the mule team's advance
So we lugged in our outfit on shoulder and pack;
'Twas a half a mile portage, and, Oh! what a chance
For a man to show yellow streaks clear down his back.

Night found us with tents set at "Hobo Camp,"
Just over the footlog and beneath the old firs:
While a campfire served as our only lamp,
Built up by the Rooks, who were out for their spurs.
With the evening meal over, we gathered around
For the Dean's annual address on camp "spre-de-core,"
And woe to the unlucky rook who was found
A. W. O. L. while the Dean held the floor.

The first night out found us early to bed
On hemlock boughs covered with deep layers of moss.
Ere the campfire coals had begun to turn red
Nine-tenths of the sleepers had started to toss.
Some had eaten too many potatoes and beans
Others found rocks, where they thot their beds smooth;
Three cups of black coffee give bumble-bee dreams,
Which nothing but morning's small hours can soothe.

"Early to bed and early to rise,"
Said Benjamin Franklin or some other shrew,
"Makes growing chaps healthy, wealthy and wise."
Now the Dean's a disciple of that maxim, too.
At four-thirty A. M., by the Ingersoll clock
He jumped from his blankets and gave a loud shout—
To our last dying hour we'll think of the shock
That followed his prolonged and lusty "ROO-OOLL O

After breakfast, crew captains were chosen to lead
And to each was assigned a crew of six men.
Equipment was issued for each leader's need
And the gang was all ready for work to begin.
Up the steep trail we scrambled in true Injun file
Falling out as we reached the assigned starting stake;
Sometime 'twas a half, but more often a mile
From the circle of tents down below the intake.

# on Mary's Peak

Then all day we struggled thru brush and thru ferns
Now up the steep slope and then down in the dell;
Until we arrived at the big open "burn"
And sat down for a smoke and a breathing spell.
We had missed our last station by fourteen links;
Our alignment was off by as many more,
While the Abney-man cussed the daily jinx—
For in fact we had missed elevation a score.

When the lingering rays of the setting sun
Cast their golden gleam among the big firs,
They marked the end of a hard day's run
With chain and compass and calipers.
Through the gathering dusk of eventide
Dog-tired and hungry, we pressed our way
Down over the trail on the mountain side
First trod by cruisers of a by-gone day.

We soon reached camp at the forks of the creek
And fires were started, the coffee to brew.
While some fried the bacon in strips long and thick
Others mixed onions and spuds for a stew.
While over it all rang out laughter and song
And stories were told of each day's happenstance;
Then we sat down to supper with coffee so strong
It would float a ship's anchor, if given a chance.

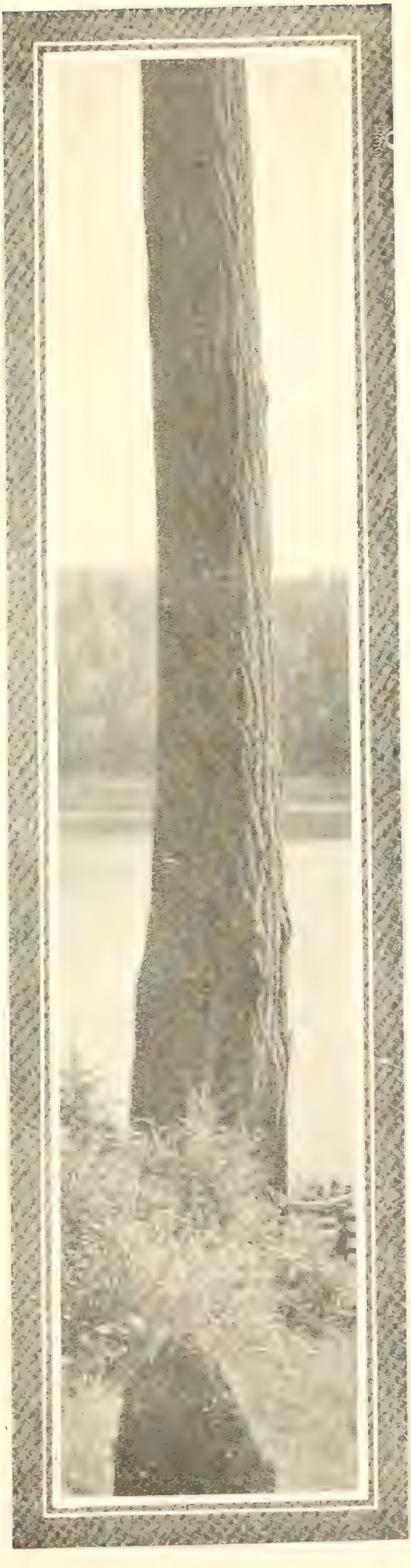
After supper was over and dishes clean,
With pipes all steamed up we prepared for some sport.
Cigars were taboo—and that's why the Dean
And some others were hailed into Kangaroo Court.
So around the big fire we sat ourselves down
And appointed a Judge to preside over all;
The sheriff, elected, soon left with a frown
To bring in the prisoners, subject to call.

There was Peavy and Newins and Patterson, too,
Professors, of course, but all under arrest;
No one is exempted from Camp Kangaroo,
Not even the Judge—Joe Steel knows that best.
The defending attorney sure has his hands full
And this is a truth which all must affirm;
No matter how well he can handle the "bull"
He loses his case—or is sentenced in turn.

Will we ever forget that drawn look of pain
As Dean Peavy stood up to await the decree,
And was sentenced to eat a raw onion—plain,
While that hard-hearted crew looked on in glee.
And Newins, found guilty of chewing Brown Mule,
Was stripped of his high-tops and placed in the ring
To teach us the art of the old dancing school —
He went even further—and attempted to sing!

Thus sped the days with their work and their fun;
Each morning we grumbled, each evening we sang,
Until the Dean told us the cruising was done
And we shouldered our packs for the trip out again.
"Oh those Forest School chaps are back from their spree
Said the Waldo Hall girls, as our trucks rolled in.
"And just look at their whiskers," said Mary McGee—
And smiling, each Forester felt of his chin.

—Harry Nettleton, '21.



# Pathology Is an Essential of Silviculture

By J. S. BOYCE, Pathologist, United States Department of Agriculture

At the present time forest regulation on the Pacific Coast is in its infancy. We stand at the beginning of the transition period from the virgin forests of the present to the regulated forests of the future and the road is long. Foresters are entirely too prone to overlook this fact and to feel that although the virgin forest is the rule now, by the time for the second cut normal forests with a definite rotation as the basis for sustained yield will be established everywhere. In other words the ideal, that is the regulated forest, is expected to be attained soon and without much effort. This idea is strengthened because we commonly base our expectations for the future on studies of the growth and yield of normal trees. As a matter of fact normal individual trees or groups in a stand are far from being a criterion of the life history of the entire stand. There are many factors such as fire, insects and disease retarding the development of virgin stands. True enough, these will have no place in the regulated forests of the future, but they are the rule, rather than the exception now. Furthermore, aside from fire, the present aggregate result of our measures for control of these injurious factors either directly by eradication or indirectly by the modification of cutting methods on logging operations is very small considering this region as a whole. We must face the fact that for decades to come insects and disease will play a large part in the life history of our forests and we must adapt our practice of forestry accordingly.

Considered broadly, forest tree diseases classify themselves into two groups. In the first group are those diseases which reduce the annual increment of the stand. Notable among these are diseases caused by needle inhabiting fungi and by false mistletoes. In the second group fall those diseases reducing the merchantable volume. Of these the various decays in the heartwood of living trees of merchantable size caused by different species of wood destroying fungi are all important. Both classes of disease have a strong influence on the life history of stands and must be carefully considered in any silvicultural system the ultimate goal of which is regulation. False mistletoe may be cited as a typical example from the first group.

The important species of false mistletoe on the Pacific Coast from an economic standpoint are the Pacific Slope yellow pine mistletoe (Razoumofskya campylopoda (Engelm.) Piper) on western yellow pine, the larch mistletoe (R. laricis Piper) on western larch, the Douglas fir mistletoe (R. douglasii (Engelm.) Kuntze) on Douglas fir, the lodgepole pine mistletoe (R. americana Nutt.) on lodgepole pine, the fir false mistletoe (R. occidentalis abietina Engelm.) on white fir, the hemlock mistletoe (R. tsugensis Rosen.) on western hemlock and the small white pine mistletoe (R. cyanocarpa Nels.) on western white pine and sugar pine. Each of these mistletoes is, with the exception of rare instances of no practical importance, confined to the host from which it takes its name. For example the Pacific Slope yellow pine mistletoe is of economic importance only on the western yellow pine, while the larch mistletoe is a menace only to the larch. And so it goes.

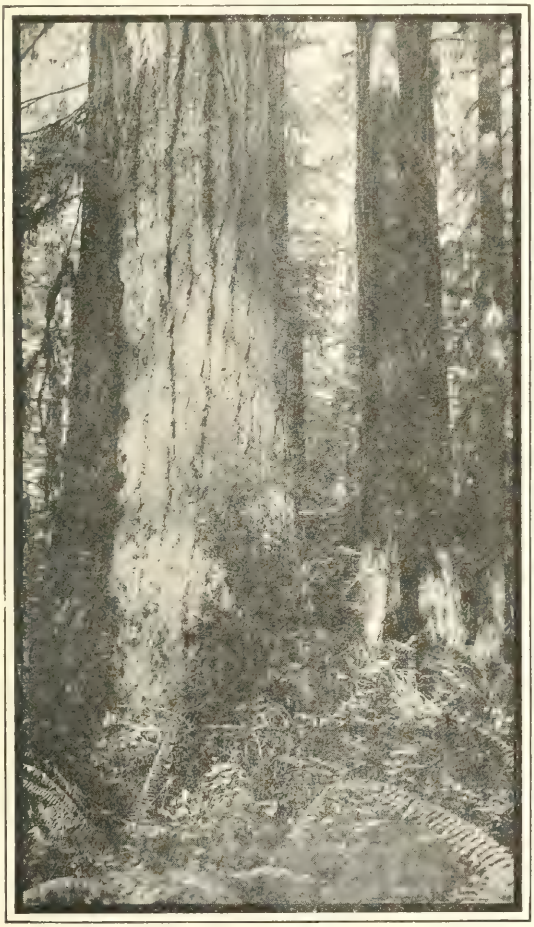
The Pacific Slope yellow pine mistltoe is particularly widespread and severe. It is difficult to find a stand of yellow pine in this region free from mistletoe. Douglas fir is also heavily infected, particularly in eastern and southern Oregon, though the parasite does not occur in the Douglas fir forests west of the summit of the Cascades in Washington and northern Oregon. The larch mistletoe is very serious on western larch in eastern Oregon and Washington.

The indications of mistletoe attack are self evident. The death of some of the infected reproduction, more especially in yellow pine, and of occasional older trees, together with the huge witches' brooms and other malformations are too well known and described to need further comment here. But the most serious consequence of mistletoe infection is the reduction of annual increment, as indicated by height and diameter growth of diseased individuals. The most valuable data bearing on this has been presented by Weir (4, table 1). Analysis of this table shows that the average height of sixty-five year lodgepole pines heavily infected with mistletoe was 18 percent less than those uninfected, while the difference in diameter growth was 19 percent and the uninfected trees averaged 60 years old. These same figures for 100 year yellow pine are 36 percent and 17 percent, for western larch 45 percent and 41 percent and for Douglas fir 15 percent and 20 percent. This difference was plainly shown by an examination of the last 40 years' diameter growth. The basis was 100 lodgepole pines, 100 yellow pines, 160 larches and 80 Douglas firs evenly distributed between infected and uninfected.

Weir (5, table 1) also presents figures showing the effect of mistletoe on height growth in yellow pine reproduction. In the table given below the writer has reduced Weir's figures to a percentage basis, that is the column headed "reduced height percent," gives the relative amount by which the average of the infected trees falls below the average of the uninfected for the various age classes.

| *Age Years* | *Reduced Height Percent* |
|---|---|
| 4 | 41 |
| 5 | 36 |
| 6 | 29 |
| 7 | 32 |
| 8 | 32 |
| 9 | 32 |
| 10 | 33 |
| Av. | 33 |

This reduction of annual increment of the stand as indicated by reduced height and diameter growth of diseased individuals must be carefully considered when establishing a rotation and cutting cycles for stands with serious infection. Placing a tract on a sustained yield on the basis of normal growth, when as a matter of fact, considerable mistletoe is present will ultimately result in a very unpleasant surprise. The rotation must be lengthened sufficiently to offset the suppressing effect of the mistletoe.



But it may be suggested that by the next cut stands will be free from mistletoe since it is being eliminated now. But this is being brought about very slowly at present. If the mature stand is infected the advance growth is also infected and it is from this advance growth that the future stand must come. In cuttings of government timber, when effort is made to rid the mature stand of infected trees and leave only healthy individuals for seed, the advance growth cannot be freed from infection since under present conditions it is not possible to cut trees below diameter limit. For example in a cut over yellow pine stand in eastern Oregon a count of the saplings varying from 15 to 25 years old which comprised the advance growth showed that 52 percent of the trees were already mistletoe infected and of these diseased individuals 80 percent had infections on the main stem. The condition was even worse than appears since many trees died in the past. On an adjacent area occupying a better site, a 7 percent infection was found. Of course by the next cut the amount of mistletoe will be somewhat reduced since the mature diseased trees are now removed reducing the amount of infection possible on the advance growth. But mistletoe will not be eliminated from infected stands by the next cut or for several cuts to come, particularly in those stands managed by the selection system or any modification thereof.

Turning now to that class of diseases which reduce the merchantable volume it is found that a number of our commercially important softwoods are subject to extensive decay. In fact some are so bad, for example, incense cedar (Libocedrus decurrens Torr.) and white fir (Abies concolor (Gord.) Parry), that they are classed as "inferior" species. The concept of the relation of the age of the tree to its rate of decay is an old one, but it remained for Meinecke (3) to first express this concretely. Working in the Klamath Lake region with white fir infected with stringy brown rot caused by the Indian paint fungus (Echinodontium tinctorium E. & E.) he found beginning at the age of 130 years that considerable decay occurred in suppressed trees, while beginning at 150 years the same thing happened to dominant trees. Weir and Hubert (6) studied the rots in western pine (Pinus monticola Doug.) and found the trees relatively free from decay until the 101-120 year age class was reached. In the case of incense cedar which is so extensively decayed by the incense cedar dry rot fungus (Polyporus amarus Hedge.) it was found (1) that trees were not subject to much decay in the intermediate range until they had passed the age of 165 years and in the optimum range until 210 years had been reached.

These ages are really pathological felling ages, or if you prefer, pathological rotations This does not mean that the species should be cut at regular intervals to conform to the above, but it does mean that the trees should not be left to greater ages unless the resulting enormously increased loss through decay is offset in some way. In each case the pathological rotation becomes a maximum limiting factor for the actual rotation. To establish this last, for a species subject to considerable decay, without determining the age at which the loss from this source becomes extensive may be worse than useless. A start has been made in this direction but much remains yet to be accomplished.

In the Pacific Northwest the most valuable tree of all, Douglas fir (Pseudotsuga taxifolia (Lam.) Br.) is very decadent (2). The principal cause of loss in this species is conk rot caused by Trametes pini (Thore) Fr. and the loss may run as high as fifty percent in some stands. The pathological felling age for this tree species is still undetermined and, what is of extreme importance to holding companies with extensive stands of mature or overmature timber, the rate at which loss through decay increases after this age has been passed is likewise unknown. The same information is badly needed for western hemlock (Tsuga heterophylla (Raf.) Sarg.) which is so badly decayed throughout the Northwest by the Indian paint fungus. Sitka spruce (Picea sitchensis (Bong.) Trautv. & Mayer) must also be considered.

Serious as are the diseases so far discussed, they do not mean the final elimination of any species from the forests of this region. So far the West has been free from epidemics, similar to chestnut blight in the East, which threatens the very existence of a commercially valuable tree. But the forester here is now faced with a new and deadly menace. White pine blister rust (Cronartium ribicola, Fischer) has invaded the Pacific Northwest. Unless this disease can be eradicated or checked, the consequences will be disastrous. True enough, most of the present merchantable volume will be saved but western white pine and sugar pine (Pinus lambertiana, Doug.) will cease to be a factor in the commercial forests of the future. Should this occur serious and unforseen problems arising from a decided change in the composition of stands where these species are found will result. The change from virgin to regulated forests would be set back for decades.

Progress along the road to regulation of the forests on the Pacific Coast will necessarily be slow. But during this period practical forest pathology must be an integral part of any silviculture worthy of the name. Unless the problems in forest pathology are solved, particularly those relating to growth and yield, serious mistakes will be made and regulation will never be placed on a solid foundation.

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# Douglas Fir Reoccupies Waste Lands

**By THORNTON T. MUNGER, United States Forest Service**

The Willamette Valley of Oregon has had a very interesting forest history and it may be read from Nature's record on the hillsides within sight of the Oregon Agricultural College. There have been in the last few centuries, and especially in the last three-quarters of a century, marked changes in the vegetative cover within this watershed. These are recorded by the evidence which the trained observer will recognize in the various types of remaining old growth timber, second growth and openings. It would be a fascinating field for the ecologist to explore and to work out in detail the changes that have taken place in the native cover and the reasons therefor. At the outset I must say that this paper is not based upon such a detailed ecological study, but only upon general observations in connection with other work through a term of years and upon detailed study of some typical second growth forests of Douglas fir several years ago. I hope that in stating my observations as such, I will not be charged with allowing speculation to overbalance evidence.

The Willamette Valley, for the purpose of this discussion, may be considered as extending from Oregon City to Cottage Grove on the south and from the foothills of the Coast Range on the west to the foothills of the Cascade Range on the east. The climate throughout is mild and humid and eminently suited to forest growth and especially to Douglas fir, which is the prevailing tree of the region. The soil also is for the most part good Douglas fir land and there are but few square miles in this whole territory that do not now carry at least some thrifty Douglas fir timber. There are scattered patches of "beaver dam land," the rather extensive area of poorly drained sour valley floor called "white lands" and some hot, ledgy slopes that are evidently not suited to coniferous growth. But in general it would be expected that in a state of Nature without human interference the whole territory would have been covered except for occasional openings with a solid canopy of Douglas fir trees. Perhaps it was in centuries long past—before the coming of the Indian. The annals of Lewis and Clark tell us that at the time of their visit the Indians reported great areas of prairie south of the falls (where Oregon City now is). The interesting question is were these "prairies" natural, i.e., were they a climax type?

The early settlers in the Willamette Valley took advantage of these natural openings and put them under the plow. Large areas of timbered land as well were cleared; thus the natural cover has been very largely altered. The whole valley and the lower foothills are now blanketed with farms, a large acreage of which is under cultivation. In the central part of the valley it would be difficult to say what was the ultimate type of native vegetation were it not that here and there are patches of land, which by chance have not yet been put to agricultural use, and except perhaps for pasturing have to all intents and purposes been untouched by man since settlement by the early emigrants. Many of these areas are covered by thriving forest growth consisting largely of Douglas fir. The observant traveler through the valley in looking at these patches of timber is at once struck by the surprisingly large amount of even-aged second growth Douglas fir from 50 to 75 years old. It would be expected that there would be a larger proportion of old growth timber, if these patches were the remnant of a vast virgin forest, most of which had been removed to make plow land. A closer study of the second growth stands shows that among them are scattered old veteran seed trees, "wolf trees" which carry limbs to the ground and show the unmistakable signs of having been growing in the open for a century or two until surrounded by their progeny. In some of these second-growth stands there is a notable absence of evidence of a previous forest other than the scattered seed trees; there are signs, however, of the former presence of much broadleaf species as might grow in brushfields or old burns. I feel that the evidence indicates that these extensive stands of 50 to 75 years old timber occupy land which for many years prior to their origin was devoid of a dense forest cover, that it was brushy land, perhaps some of it actually grass covered, but that there were scattered old Douglas fir veterans here and there, the survivors of a former forest which had persisted in spite of the agencies which prevented a full stand of timber. This theory is supported by the old settlers. In a flat part of the valley near Eugene, an old man has been running a sawmill on 49 year old timber where as a boy he said he could see a cow or a deer for a half mile. The area was brushy, he said, but the brush not high enough to prevent seeing over it long distances. He remembered seeing the Indians fire such areas each year during the fall migrations.

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*Revision of a paper of the same title read at the meeting of the Pacific Northwest section of the Society of American Foresters held in connection with the annual convention of the Pacific Division of the American Association for the Advancement of Science, at Seattle, Washington, June 17, 1920.

On the outer edges of the valley, on the foothills, where agriculture has not interfered with the native vegetation, the evidence of what has been taking place in the last century is even clearer than in the central part of the valley. Here there are bald hills, now grass covered or dotted with oak "grubs," as they are called locally, and other brush. These bald hills, except possibly the most shallow soiled, are certainly ultimate Douglas fir land. To be sure farther south in the Umpqua and Rogue Valleys some of the bald hills are probably not forest land because of their extreme dryness, but in the region considered in this paper all sites of this nature should bear Douglas fir. There are other hillsides in the foothills carrying now the most beautiful stands of 50 to 75 year old Douglas fir, which, from the evidence on the forest floor, were formerly as bald as the neighboring grassy hills now are. In short in the last half century or so there has been a process of encroachment of the forest on the areas which previously had been grassy and brushy and almost treeless. This process may be seen in various stages of completeness, and is apparently still going on. Sometimes the second growth came in all at once and uniformly over large areas, as though spontaneously changing from brush land or grass land to Douglas fir. Elsewhere the reforestation of the bare areas is taking place by migration from adjoining timber as spruce and white pine occupy the old pastures in New England. It is further noticeable up in the foothills of the Cascades where the rivers cut westward toward the valley that the north facing slopes are generally covered with old growth timber and that on the south slopes there is much less old growth and a great amount of second growth, dotted with remnants of an old growth forest. Many of the south slopes are still bare, but I am willing to venture the opinion that if left alone they will in time be covered by Douglas fir.

I am therefore forced to the conclusion that the open prairies and brushfields of the Willamette Valley, which the first emigrants found, are not permanent types, that the bald hills of the south facing foothills should not be bare, that Douglas fir is the natural cover on all such areas and were it not for the upsetting of Nature's equilibrium by some condition, probably induced by man, such areas would be forest clad. My reasons for so believing are twofold: First—not a very scientific reason—is that there appears to be no explanation why they should not be timbered, if left to themselves. The climate is ideal, and the soil aside from the exceptions noted above is satisfactory for forest growth. My second reason is that there is very abundant evidence to show that during the last sixty years or so there has been a marked encroachment of the forest on land hitherto largely deforested, wherever it has been left untouched by man, both on the flats in the main valley and on the south slopes of the foothills.

There must be some explanation of the non-forested condition of these areas at the time of Lewis and Clark and of the changes that have taken place since that time to enable woods to return to the once bare areas. Again we get our cue from the early history of the valley as told by the old settlers. They know that there was a large population of Indians in the valley, that they were horse-using people and that it was their custom as they migrated from the mountains or foothills to the valley in the fall to leave a mass of forest fires behind them. There is some dispute as to whether these fires were set chiefly by accident or intent, but is seems most likely that these Indians intentionally set many fires. In fact it has been reported that they systematically burned one side of the river one year and the other side the alternate year. In this region they were successful in accomplishing their purpose of eradicating the forest and making easier hunting and better pasturage, where they might not have been in another region. This valley experiences a long, hot, dry summer, and this naturally increases the severity of forest fires and make surer the transformation from forest to prairie or brushfield. Furthermore, on the sites least favorable to forest growth, as on the hot south slopes, the balance between conditions suitable for forest growth and those unsuitable for forest growth is delicate, and such a disturbing factor as frequently repeated forest fires very easily upsets Nature's balance. It is noticeable that the process has been much more completely accomplished on the hotter south slopes than on the north, for often a south slope is bare, while the north slope on the other side of the hill is still covered with old growth timber, which, however, usually shows signs of frequent visitation of surface fires. The forest has been able to hold its own on the more humid north facing sites, while on the drier sites it has succumbed and been succeeded by grass and brush. I do not believe that this process of slow deforestation would have been accomplished farther north, as for example in the more humid Puget Sound territory, under a like subjugation to repeated fires.

We may conclude, therefore, that great areas of potential forest in the Willamette Valley were converted to brush and prairie by the long and oft repeated action of fires set by the aborigines. This process may have been extended over centuries. During all this time we must assume—and the evidence supports the hypothesis—that every tree was not destroyed, that patches of old timber survived here and there, and that the prairies and the brushfields were more or less dotted with thick-barked veterans, some of which survived the periodic surface fires. Each of these old trees was giving seeds and struggling to reproduce itself. Doubtless at intervals seedlings of Douglas fir started to recover prairies and brushfields, but were killed by the next fire before they had become established. Some of each new crop probably survived and are the scattered bushy veterans we now find. It is not reasonable to suppose the Indian fires were so frequent or all embracing as to preclude all natural reproduction of Douglas fir and prevent the survival of some stands and individual trees throughout the valley.

We come now to the next question with which the investigator is confronted. If portions of the valley and foothills were nonforested three-quarters of a century ago, why are they now not in like condition? Why is there so much 50 to 75 year old second growth? It would be expected that the coming of the white man would have made conditions even more disastrous to forest growth. It is usually supposed that the agricultural pioneering of a country increases the fire menace to adjoining forest land. Here the opposite seems to have been true. Under the regime of the white man there have been less fires than under the Indian, in the regions contigious to the farming country, probably not in the mountains. This is natural for with the settlement of the valley and the development of arable areas the patches of brush land remaining uncleared become surrounded by fields and to a certain extent immune from general broadcast surface fires. Moreover, it was to the interest of the farmer to keep fire out of the brush land or woods near his place to protect his buildings and fences, if for no other reason.

Coupled with these influences toward forest protection is the fact that about simultaneously with the coming of the white settlers the Indian population dropped off rapidly—partly due to measles or smallpox. We thus have about 1850 or 1860 a cessation of the menace of Indian fires and the wholesome influence of the white man in keeping fires out of the region adjoining his settlement. Fires by no means stopped altogether, they haven't yet—but there was apparently enough decrease in their frequency and extent to throw the balance in favor of forest growth. Hence followed the reoccupation by Douglas fir of land which, as a real forest cover, it had been driven centuries ago, and the resulting thousands of acres of beautiful second growth stands now about sixty year old.

We have therefore the anomaly of an addition in the acreage of productive forest coincident with the occupation of the country by the proverbially destructive pioneer. It is by no means a net increase in the acreage of forest, for the clearing of forest land both for agriculture and in logging operations has progressed much faster than waste brush land has been reoccupied. But due to the history discussed above and to the tremendous virility and aggressiveness of Douglas fir we now have thousands of acres of rapidly growing forests in a virgin forest region where such a large acreage of young timber would hardly be expected.

# Method of Securing Topographic Detail

**By F. MARION WILKES, Forest Topographer**

It is essential that reliable elevations be obtained upon which to base topographical detail and it is the purpose of this article to set forth the methods used by the United States Indian Forest Service.

Our topographic maps are made from data taken with the topographic hand level and trailer tape simultaneously with an estimate of the timber on an area and is conducted by from three to six crews consisting of an estimator and compassman each. The strip method is used, usually two uniformly distributed strips per forty, only in very scattered timber where there is not a great deal of topographic detail, then, a single strip is run, the estimator "snagging" the rear end of the trailer tape and making an estimate of the merchantable timber on a strip one chain in width on either side of the compass line in uniform timber, this being a twenty percent estimate for the double strip or a ten percent estimate for the single strip, or if in uneven or bunchy timber the estimate may be from twenty-five to one hundred percent depending on, what, in the judgment of the estimator, will give an accurate estimate for that particular stand. The compassman lays out the compass lines, holds the front end of tape, determines elevations with the hand level, and sketches in drainage, type lines, culture, etc., as well as form lines wherever the surface configuration changes, over that part of the strip that he can see. The crews start from base lines distributed usually at intervals of four miles apart, run, if possible, so that the direction of the strip will be across the drainage rather than with it, and run their strips in circuits, two miles over, make the necessary offset and correction for alignment, and return two miles to the base lines, the strip lines starting from a point and returning to another point of known elevation, thus supplying the data to correct any run of hand levels, measurement or alignment.

These base lines are initiated from the most reliable elevations obtainable, the bench marks of the United States Geological Survey or the United States Coast and Geodetic Survey, nearly always being available within a reasonable distance. They are run along section lines following the blazed line of the original survey and points or stations are set at proper intervals along this line from which to initiate the strip surveys. We employ a combination of differential leveling and trigonometric leveling on base lines using the transit equipped with vertical circle and stadia wires and the stadia rod, (the saw-tooth telemeter rods graduated in tenths is used), for determining positions and elevations of stations. This is accomplished by the transit occupying alternate positions generally approximately midway between stations while the rod is set at the station proper when practicable. On level ground the transit is set up at the most advantageous point and the distance to it is read on the stadia rod while the height of instrument is determined as in differential leveling, the rod is then taken ahead and the position of the station determined by the stadia and the elevation is then determined as in differential leveling. On sloping ground the distance is determined as before, and the middle wire of the transit set on some convenient point on the rod, usually on an even foot mark nearest the middle wire when the stadia distance is read, the vertical angle is then read, and the difference in elevation due to slope being read direct from the stadia slide rule. To this difference of elevation the rod-reading is added or subtracted, the rod-readings on back sights being treated as plus, while the proper sign is given to the vertical angle, angles of rise being plus and of depression being minus. Combining these values algebraically, the difference in elevation between the last station and the transit or H. I. is obtained. If the vertical angle is greater than two degrees for ordinary length sights a correction for slope will have to be made to reduce to horizontal distance. This is readily obtained from the stadia slide rule. The distance to the next station is then determined and the proper addition made to this distance to correct for slope, this being determined from the stadia slide rule, the station is then "spotted," the midde wire set on some convenient division, simplifying matters if an even foot mark is used. The vertical angle is then read and the difference in elevation, due to slope, is determined, as before. The rod-readings on fore sights are treated as minus, while the usual signs are given the vertical angle. The rod reading is then combined algebraically with the above difference, this giving the difference of elevation between the H. I. and the station ahead.

The stadia slide rule is graduated so that settings can be made for any distance or vertical angle and the difference in elevation due to slope for that distance and vertical angle as well as the horizontal distance is read directly from the rule. It is based on the usual stadia formula, the difference of elevation being the slope distance × ½ sin. of twice the vertical angle, while the horizontal distance is the slope distance × cos.$^2$ of the vertical angle.

Readings are taken to the nearest tenth of a foot in differential leveling and the readings from the slide rule, it being a useless refinement in this kind of work to try to attain a greater degree of accuracy, it being found that this is within the accuracy of the transits used and the results are a great deal closer than would be expected.

One of the advantages of this method is that the open pine timber of this region from two to four miles of base line can be run per day by a crew of two or three men with a much more consistent run and with a great deal more accuracy than can be obtained with the hand level, it being nearly as accurate and a greal geal more rapid than by the usual differenital leveling, and at the same time eliminating the necessity of chaining the line for the position of stations.

Our base line crew consists of an instrument man, who handles the transit, takes and records data for elevations, and sketches topography for a short distance on either side of the section line, a rodman whose duty it is to hold the rod on stations and pace the approximate distance between stations so that he may be placed on a station in the minimum of time, and an axeman who prepares and marks stakes for stations, reblazes the section lines and cuts brush when necessary.

The base lines, where practicable, are run in circuits, it not being considered advisable to run a long line of levels without ties to adjacent lines or to points of known elevations. Some of these lines are forty or fifty miles in length, making it necessary to complete a circuit or to tie to points of correct elevation so that the proper adjustment for elevations on base lines can be made.

The topographic hand level and trailer tape, by which data is obtained for the topographical map, is an improvement over the ordinary Abney hand level and chain tape. The level is larger and its adjustments are more stable than the Abney. In place of the usual degree graduations its vertical arc is graduated in even feet difference of elevation per chain of 66 feet. The trailer tape, which is slightly over 2.5 chains in length, has a trailer etched on the opposite side and follows both the one and two chain points and is graduated with the same marks as the arc of the hand level so that to determine position and difference of elevation it is necessary for the estimator to pick up the tape at a point beyond the chain or two chain point, which is of the same reading as that on the hand level, thus the line is advanced on the slope one or two chains, as the case may be, enabling the compassman to sketch in form lines, etc., without having to make reductions for horizontal distances due to slope. The differences of elevation in feet per chain is read directly from the arc of the hand level by the compassman, the basis of graduation being the tangent rather than the sine of the angle of slope as in the ordinary determination of difference of elevation by slope measurements. A graduation is made for each foot while the fractions of a foot are estimated. For any distance other than one chain, the arc reading is multiplied by the chains and decimals of a chain in that distance being correct for any horizontal distance. The trailer graduations are in the same numbers as are those on the hand level being simply the external distance or the exsec. of the angle of rise corresponding to each graduation × one or two chains for the respective trailers.

The elevations then are a succession of "shots," each in which the estimator stands over a point of known elevation and allows the compassman to go ahead a certain horizontal distance where he sights back to a point on the estimator at the same height as his own eye, then the difference of elevation is determined by the hand level reading multiplied by the distance taken and this difference is added to or subtracted from that elevation, accordingly as it is above or below that point.

The above methods were developed to allow of greater accuracy for data on which to base topography than was possible with barometer and pacing and is more accurate and faster than the Abney hand level. It has been found more economical and satisfactory to run all base lines with the transit as outlined than to depend on the hand level for a part of the base line elevations.

The following examples of back and fore sights present the different conditions that can arise in setting stations 660 feet or ten chains apart for single strip surveys:

BACK SIGHTS

| Station | Direction | Stadia | Vertical Angle | Rod Reading | Diff. of Elevation | Elevation | Remarks |
|---|---|---|---|---|---|---|---|
| B. M. | | | | | | 4345.1 | Top of stone at cor. secs. $\frac{5:4}{8:9}$ 31-9 |
| ① | North | 335 | ............ | ........ | + 5.7 | 4350.8 | |
| or ② | North | 335 | +11° 36′ | +5.0 | +71.0 | or 4416.1 | 321′ +66.0 |
| or ③ | North | 335 | — 9° 21′ | +4.0 | —49.7 | or 4295.4 | 326′ +53.7 |

① is the sight taken on level ground as in differential leveling.
② is a slope shot where the vertical angle is plus.
③ is a slope shot where the vertical angle is minus.

The difference in elevation due to slope and the horizontal distance is carried in the remarks column and the combined values of rod and difference due to slope are carried in the column Difference of Elevation.

FORE SIGHTS

| Station | Direction | Stadia | Vertical Angle | Rod Reading | Diff. of Elevation | Elevation | Remarks |
|---|---|---|---|---|---|---|---|
| 10 ch.① | North | 325 | ............ | ........ | — 6.3 | 4344.5 | |
| or ② | North | 344 | + 7° 01′ | —7.0 | +34.6 | or 4450.7 | 339′ +41.6 |
| or ③ | North | 355 | —14° 05′ | —7.0 | —90.8 | or 4204.6 | 334′ —83.8 |

The numbers ①, ②, and ③ are given under the same conditions as above and the elevations are reduced from their respective numbers.

# · THE · ANNUAL · CRUISE ·

| | | | |
|---|---|---|---|
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The school year of 1921-22 has indeed proved a banner year for the O. A. C. school of forestry. The registration for the last three terms has exceeded that of any previous year in the history of the school. That the school is receiving increasing recognition from practical lumbermen was evinced at a recent meeting of the executive committee of the Pacific Logging Congress at Portland. At this meeting it was agreed by the representative operators who attended that all O. A. C. undergraduates in the school of forestry would be given employment in their particular field of work during the summer months. In keeping with this agreement and to provide for the proper training of the student in the practical end of his work, it has been ruled that no student can obtain a degree from the school of forestry without having had at least six months' field experience.

Cooperation between the school and practical business men is further evinced by the willingness of these operators to leave their business and spend their time before the forest club in order to acquaint the students with the requirements of their profession and the problems they will be expected to solve when they have graduated.

A ten year ambition of the school was realized this summer when a 160-acre tract of cut-over land on the southeast slope of Mary's Peak, 15 miles from the College, was presented to the School of Forestry by the Spaulding Lumber company and Fred Leadbetter of Salem. This tract is to be used for silvicultural experiments, particularly with Douglas fir.

The gift by Fred Leadbetter of a $10,000 miniature paper mill complete in every respect, and capable of turning out paper of any desired quality, is a valuable addition to the technological equipment of the school.

With these signal accomplishments of the school during the last year in mind, and noting the increasing interest of the public in the conservation and perpetuation of the forests, the forestry student at O. A. C. has every reason to "carry on" with the utmost confidence in the future of the school and his chosen profession.

## THE FOREST CLUB

What is the Forest Club? It is a combined social and technical organization composed of the entire enrollment of students and faculty in the School of Forestry. Meetings are held on alternate Wednesdays throughout the school year. These are either business, social, or technical meetings as the occasion demands. For the technical meetings men are obtained from various branches of the forestry, logging, and lumbering industry to give talks relating to their particular phase of the work.

The social meetings are usually smokers held in some hall or at camp-fire gatherings out in the now famous Avery's wood-lot. At the campfires it falls to the lot of the rooks to get together the material for the smudge and to see that there is no cause for anyone's appetite to go unsatisfied.

On the campus the foresters and loggers are known as the "Fernhoppers," an appelation which has rather recently been given and which is apparently here to stay. The Forest Club's enemies in more or less mortal combat are the Miners, more commonly known as the "Muckers"—the crawlers of the dirt. The fernhoppers have for years kept them in complete subjugation, except for a few accidents, and they will continue to do so for years to come.

### Activities of the Year

The first bonfire of the year was held October 5, in Avery's wood-lot. Speeches, yells, and songs were the order of the gathering. "Bill' Owens lead the gang in giving the muckers the axe, and in E. Pluribus Unum. Mr. Tarwater, famous humorist and owner of Avery's wood-lot, gave one of his favorite stories. The pledging of Tom Owens, Elmer Balderree, and G. A. Duncan to Xi Sigma Pi was announced. The meeting broke up with songs and yells.

The second bonfire was held January 25. The honorable Dean appeared with his pedal extremities adorned in rubber boots. He made excuses for same at least ten times until finally got up before the entire Club and asked to be pardoned for wearing rubber boots which properly belong to the "low down wallopers across the campus," (meaning the "muckers.") Sandwiches, coffee, sinkers, apples, and raw meat composed the menu for the evening. Mr. Tarwater gave a short speech and told a "unique" joke, which was loudly applauded. The pledging of "Bill" Owens, W. D. Lovegreen, Bernard Nutting, "Ed" Sweeney, and Louis Gervais to Xi Sigma Pi was announced. The program ended with a few choice songs given by the "dirty dozen loggers."

Only one blot is to be found upon the otherwise spotless records of the Club for the year and that was when the lowly Muckers managed to defeat the Club in a football game. They were shown their place in basketball, however, when they were defeated in a close game 12 to 10.

The men who gave technical speeches to the Club included Dr. Boyce, of the pathological department of the forest service, who, on November 20, talked on the appearance of the white pine blister rust and its menace to the Pacific Coast forests. Louis Gervais, a student, gave a talk, January 11, on the method the government uses in cruising timber on the Indian reservation; and George M. Cornwall, editor of the Timberman, gave a speech January 19, on the past, present, and future of China, Japan, Siberia, with special emphasis on the lumber trade with Japan. W. B. Osborn of the Forest Service and designer of a successful device for locating forest fires, spoke on forest protection and the control of forest fires, January 8 and 9.

## THAT SPRING CRUISE

"In Spring a young man's fancy."—Tennyson.

Tennyson was very correct in his statement and who knows it better than a college man, for in spring a young man's fancy turns to the primitive cave man, and books and school amount to little. Just about the time when the loggers had forsaken the Forestry Building to lay in the grass and watch the co-eds roll by in front of the Library, the Dean's ingenuity devised plans whereas the School of Forestry might be released from the fantastic touch of the lovery embrace of Spring.

We knew it was coming and all our talking, bulling, and such amounted to nil. The Dean had decided that he would have no lounge lizards or campus rats in his school, and the only way to rid it of such was to take a nice little spring cruise in the vicinity of Mary's Peak. There, he said, would be no co-eds to keep the boys awake at night, no nice grass to lie on, no sidewalks to spit tobacco juice on, and above all no rat dances to go to. The Dean was right, the gang was rapidly becoming a bunch of tea houdns, but as there are times it's good to be bad, we hated to leave.

Mary's Peak is a very nice place, to be away from, or to talk about, but at five o'clock on a frosty morning listening to the Dean's song of "Rol-l-l Out," makes you think you would rather live where Sam McGee spoke about. The Dean's idea of humor isn't to be joked about, and after the first day the work proceeded in A. 1 style.

Four sections had to be cruised and mapped, and we had to do it. We started to get up at five a. m. and before the coffee was half done we were four miles out in the jungles. "Up and down, in and out" and then back again. Every day was the same except that it rained on some days and we did not have to wash, and therefore we had time to eat half our breakfast before we started out.

The Dean's idea was a masterpiece and by this time it was working to perfection. We would have given up everything to be back in the old Forestry Building asleep in our classes, but might is right, and we soon learned Who was Who and settled down to work like good little boys.

The work was all outlined for us and we had only to follow the plan laid down by the Dean. The plan was something like this: The four sections were divided into strips and each crew cruised and mapped the strip assigned to it. A base line was run out and each crew took this as its control. In fancy language, the United States Forest Service gridiron method was followed out, (after a fashion.) But there is no use trying to explain the technical side of the cruise for anyone that reads this will most likely get a headache trying to figure out what kind of a system we did use. Nevertheless the cruise was a success and we ran short on both compass lines and grub.

On the more important side, which was around the fire, many interesting events happened. The old time kangaroo court was held and everyone from the lowest freshman up to the Dean was booked on something. Our friend, Cricky Holmes, mussed up the water-shed and after a heated discussion took his ducking. Along about this time the gang had forgotten all about the glorious ideals of the campus and the bunch were rounding into form like true loggers, but who wants to log when in the woods? The best place to log is on someone's front porch or on a blanket party. The gang got all "heted" up talking on the subject and one fine morning Bremner, Gilbert, Hewitt, and Sweeney, showed up in camp with a fresh shave and hair-cut. They brought in the news from the outside, that the campus rats were going in great form. The sun had been shining every day, and before night the rest of the gang had their minds poisoned by these buzzards that had escaped the Dean's eye and had gazed once more on the fair sights of the Oregon Agricultural College.

There was no way out of it this time, the gang wanted to go home and every hour of the day you could hear the boys singing:

It's home, boys, home; it's home we ought to be.
Home boys, home; to hell with Forestry;
And when we hit the campus
We'll sleep about a week,
And tell them about the rotten time
We had at Mary's Peak.

The Dean was very considerate this time, the work was all finished, the reports all O. Ked., the timber all cruised and above all the grub was all gone, so that night he gave the word that there would be "no roll out" the next morning, but we would get up as we would and be ready to leave at noon. Oh, boy! but those were sweet words, and to show our appreciation the whole gang stayed up and kept the Dean awake by singing songs until the wee hours.

The next day, the last day, and best day, we left for town. It was the most beautiful day of the year; the birds were singing, children were playing; the sun was shining; there was music in the air. In fact it seemed as if the skies had opened up and heaven dropped out. It was wonderful how magnificent the campus and school looked after a ten day leave.

The gang broke up at the Forestry Building each to his own house, thus ending the most glorious, trying, but more than successful Spring cruise of 1921.

## THOSE FRIDAY TRIPS

Br-r-r-ring goes the old alarm clock. It's six o'clock and we have to get up to go out on our weekly trip to Mary's Peak to take that topography. The members of the Senior class in Logging Engineering have enjoyed themselves working every Friday since school began last fall, taking five sections of topography and surveying five miles of railroad.

Prof. Patterson usually arrives at the Forestry building about a quarter to seven and spends the next half hour getting the instruments together and getting the crew started at seven o'clock. When the word "Let's go!" is given we all pile into "Six-Bits" (nickname of the new Samson truck) and Tom Owens steps on the gas and out we go. Going through the campus we give the early birds the glad yell as we bump along.

Our first stop is Philomath (unless "Six-Bits" gets tired) and here we all get out and warm ourselves by the grocery store stove, take another chew, and buy or get walnuts while the goat of the outfit buys coffee, cream, and sugar for our mid-day nibble. From Philomath we're off for the mountains and we stop next when the truck slips off the puncheon near our jumping-off place. Everybody but Chung gets out and puts his shoulder to the wheel and his back to the axle and on the road she flies. The first one in the truck gets the best seat and the last one gets corked.

Finally we arrive at station Zero, Zero, and here we leave Six-Bits in peace until the 5 o'clock whistle blows. Here we bring out our instrument and Prof. Patterson cools us down long enough to give us instructions and assign us to our different jobs. We then walk what seems like five miles, until finally we get to the stations on the base line where we begin our day's work. We proceed with taking topography as follows, first we tell a funny story, then we ask the time of day, then we cuss the weather, then we adjust our instruments, and then we take our mile of topography, and by that time it is noon so we all meet at the appointed station and start bawling out the bull cook for not having the coffee ready.

By this time we are all eating our sandwiches and talking on many subjects, but the chief topic being a long since dead horse that can be easily found by anyone up on the land given to the school by Spaulding. After a while when everyone is comfortably picking his teeth, the four harmony hounds begin burdening us with their harmonious discords. Crickey then pulls out his match box and opens it and, what ho! a cigar snipe carefully and tenderly preserved from the strenuous morning. Brad demands half of it and Crickey gives him the wet half. Pat then adjourns the meeting by announcing that the woods are waiting and the time is not. We all then race out like snails and start our afternoon's work.

The afternoon is generally a race to see who will have the longest time to rest before the truck starts. Tubby Walnuts has been awarded the lead medal for speed. He took a mile of topog. in forty minutes. Balderree and Pop Day are our compass line artists. They ran a north line at an angle of 45 degrees from magnetic north. Their compass line went from one corner of the section to the far corner on the opposite side. Chung has discovered a new compass. He declared that no matter which way you turn it the needle always points toward the north!

During the ride back to town everybody is kept busy fighting and singing alternately. Bill Owens invariably declares himself a non-combatant in the fighting, not so in the singing. His list of songs would make Caruso ashamed of himself. Coming into Corvallis we give the Tri-Deltas the har, har. Ye, and Love-lorn Lovegreen steps or falls off the truck at the house where the pretty girl lives. The rest of the freight drops off along the road to the Forestry Building and the truck is carefully driven into cold storage until next Friday.

## XI SIGMA PI

During the spring of 1917 the seniors of the School of Forestry organized a local honorary forestry fraternity known as Sigma Lambda Epsilon. Due to the war nothing was done until the fall of 1920 when the organization was revived and later petitioned Xi Sigma Pi, national forestry honor fraternity. Zeta chapter was installed at O. A. C. on June 11, 1921.

Zeta chapter is the sixth chapter of Xi Sigma Pi to be installed and forms one of a chain of chapters reaching from the Atlantic to the Pacific. Election to the fraternity is based upon ability. Only upperclassmen who have a high scholarship record; have had actual experience in the woods, and who have taken an active interest in the Forest Club and its work are chosen for membership.

The men who have had the honor of being elected to Xi Sigma Pi are: Dean Geo. W. Peavy, Professor H. S. Newins, Professor J. P. Van Orsdel, Professor H. R. Patterson, Earl G. Mason, W. J. Chamberlin, C. C. Jacoby, C. R. Hazeltine, W. J. O'Neil, H. I. Nettleton, C. A. Rickson, E. S. Young, J. W. Medley, Geo. Luebke, J. I. Steel, R. P. Conklin, E. W. Balderree, G. A. Duncan, T. S. Owens, Louis Gervais, W. D. Lovegreen, B. N. Nutting, W. O. Owens, E. J. Sweeney.

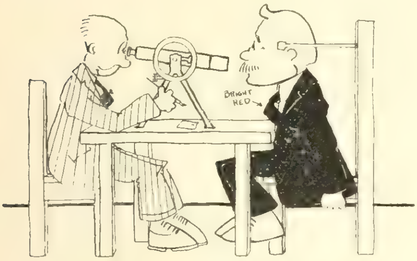
**Think It Over:** To sow a thought is to reap a habit; to sow a habit is to reap a character, and to sow a character is to reap a destiny.

## FRIENDS WE OVERLOOK

The curriculum of the Forestry course includes nearly all of the sciences which affect, even indirectly, the forester's work. Fifteen credits of work is expended in learning the names and, to some extent, the silvical characteristics of our indigenous trees. The forestry graduate doesn't consider himself profficient unless he knows not only the common, but also the scientific name of any tree he runs across. However, there is one interesting factor in forestry and silviculture practice which the average forestry student does not become interested in and that is the relation of the common birds to the forest.

The average forester cannot correctly name, with the possible exception of game birds, more than twelve or fifteen of our common birds. He knows, in a general way, that birds are useful in controlling insect and rodent pests but he does not have the definite information on the subject which a college graduate should have.

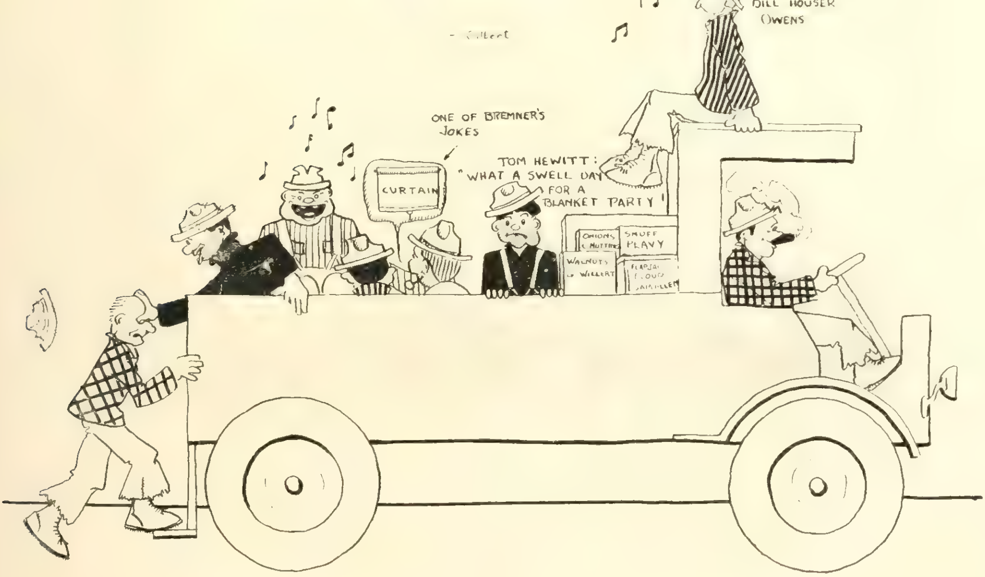
The O. A. C. library contains an exceptionally good collection of works on Ornithology. Many of them, aside from the



PROF. MASON FINDING THE GROWTH RATE PERCENT AND AVERAGE DAILY YIELD OF DEAN PEAVY'S SCRUBBY, SECOND GROWTH WOOD LOT

OH, THESE ARE WALNUTS ARN'T THEY? I GUESS I'LL BUY 5¢ WORTH

## WITH THE LOGGERS IN THE FIELD



interesting material which they contain, are so entertainingly written that it is a pleasure to read them. Why not spend a few hours in the library this spring and then, when you go out into the woods this summer, add a few new birds to your list of acquaintances.

You will find, if you follow the work up, that the study of Ornithology is intensely interesting. It is a hobby which may be enjoyed the year around. Birds, like the movies, provide a constantly changing attraction. Unlike the movies, however, they do not charge admission and they can be enjoyed as fully in a logging camp as in the city.

Corvallis Retail Lumber Yard
Corvallis, Oregon.

Holmes Timber Co.,
Wren, Oregon.

Dear Crickey Holmes: In regard to my order for a carload of No. 1 common and dimension stock, I wish to state that the knot-holes have been received; kindly send the knots.

Corvallis Retail Lbr. Yard.
Per Bradley A. Peavy.

**Think It Over:** Heaven never helps the man who will not act.

## "WILL THIS HAPPEN TO YOU?"

When you've gone to school four toilsome years
And got your sheepskin by the ears;
When you've said goodbye to all the boys,
To co-eds, fun, good times, and noise;
You turn to the woods with expectation
Of fame and wealth in swift rotation.
You hit the ball from dawn till night,
You soon become an awful sight;
The squirrels become your associates,
You eat your grub from old tin plates;
Your hair grows out in great profusion,
And life is just one long seclusion.
So time drags by, your hair turns gray,
"Its sure too bad," your old friends say;
"That a man with the brain of a financier
Should be a Logging Engineer."

F. B. W.—'23.

## DRAMA IN THREE SPASMS

1. Volstead
2. Homebrew
3. Von dead.

Photographs, like some people, are better liked if they are well developed.

Ten-Ton "Caterpillar" Pulling 12,600 Feet of Idaho White Pine at Diamond Match Company

THE HOLT MANUFACTURING COMPANY

J. W. HILL, Agent TRACTORS 529 Henry Bldg., Portland

# What Alumni Are Doing Now and Then

This list of names is as complete and correct as we could obtain. If your address is wrong, or when you change, please drop us a line. You may know something of these men and could put us in touch with them. It is only with your cooperation that this list is of any benefit.

Allen, John W., ex-1923, Eugene, Oregon.

Alstadt, George J., 1920, B.S., L. E., Beuhner Lumber Company, Allegany, Oregon.

Anderson, Edmund G., 1915, B.S., L. E., fuel business, Albany, Oregon.

Archibald, Harold G., 1916, B.S., L. E., captain, professor of military tactics and science, care University of Kansas, Lawrence, Kansas.

Barbur, Harold H., 1911, B.S., F., Multnomah road master's office, City Hall, Portland, Oregon.

Bates, Edward G., 1915, B.S., F., Ocean Home Farm, Gearhart, Oregon.

Billie, Brewer A., 76 Commercial street, Astoria, Oregon.

Blackden, Earl B., ex-special, killed in action in France.

Blackden, Ralph S., 1915, B.S., F., teacher in manual training, Snoqualmie, Washington.

Bodine, Rodger C., ex-1921, 725 East Walnut street, Pasadena, California.

Boehmer, Karl C., 505 Market street, Portland, Oregon.

Bracher, Karl, ex-special, manager retail lumber yard, Sheridan Lumber Company, Sheridan, Oregon.

Brennan, A. F., 1920, B.S., F., 816 South Tenth street, Boise, Idaho.

Brett, Sereno E., 1916, B.S., F., major in United States Army, headquarters 344 Bn. Tank Corps, Camp Benning, Georgia.

Budilier, Clarence J., 1917, B.S., L. E., logging engineer, Mabel, Oregon.

Campbell, Tom P., ex-1918, McMinnville, Oregon.

Casey, John M., ex-special, with Casey Lumber Company, Metcham, Oregon.

Chamberlin, Willard J., 1915, B.S., F., forest entomologist, assistant professor O. A. C., Corvallis, Oregon.

Chapler, Raymond H., 1915, B.S., F., inspector forest service, Portland, Oregon.

Chase, Ernest, 1015, B.S., F., rural carrier, Corvallis, Oregon.

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Chrisman, Robert J., 1915, B.S., F., Robert J. Chrisman Lumber Company, 621 Morgan building, Portland, Oregon.

Clancy, James P., ex-1918, manager Lebanon-Santiam Lumber Company, Lebanon, Oregon.

Coman, Ellis S., Corina, California.

Crawford, James A., 1917, B.S., L. E., teacher high school, Post Falls, Idaho.

Cronemiller, Lynn F., 1914, Eastern Oregon Lumber Company, Enterprise, Oregon.

Culver, Benjamin J., B.S., F., 326 East 71st street North, Portland, Oregon.

Daniels, Clarence M., ex-1920, farmer, near Corvallis, Oregon.

DeMello, Sezefredo S., Escola Enzenharia, Port Alegre, Brazil.

Deutsch, Henry C., 1915, B.S., F., Alsea Lumber Company, Glendale, Oregon.

Dutton, Walt L., 1913, B.S., F., grazing inspector, United States Forest Service, Baker, Oregon.

Eberly, Howard J., 1911, B.S., F., deputy State forester, Salem, Oregon.

Eilertson, John, ex-1921, logging engineer, Clatskanie, Oregon.

Elofson, H. W., 1918, B.S., F., grazing examiner United States Forest Service, Missoula, Montana.

Emery, Lee Earl, 1914, B.S., F., farmer, Eugene, Oregon.

Evendon, J. C., B.S., F., Bureau of Entomology, Coeur d'Alene, Idaho.

Ferguson, Vance T., ex-1919, Alameda Drive, Portland, Oregon.

Fertig, Chas. A., 1917, B.S., L. E., Waldo, New Mexico.

Fraley, Lawrence K., ex-1919, 393 14th street, Portland, Oregon.

Freydig, Paul E., 1914, B.S., F., logging engineer in charge of railroad construction, Clarke-Wilson Lumber Company, Linnton, Oregon.

Fugh, Paul Chen., ex-1919, Cornell Forestry School, Ithaca, New York.

Gill, Harold C., 1910, B.S., F., J. K. Gill Company, Portland, Oregon.

Haberer, Erwin S., ex-1919, Troy Laundry Company, Pendleton, Oregon.

Hartley, Edwin A., ex-1917, 6712 North Seventh street, Oak Lane, Philadelphia, Pa.

Hazeltine, Carol R., 1918, B.S., L. E., first lieutenant, Vancouver Barracks, Vancouver, Washington.

Hayes, Marshall C., Jr., 1914, B.S., F., deceased 1918.

Hayslip, Earle, 1921, B.S., L. E., R. F. D. No. 6, Vancouver, Washington.

Healy, Roger D., 1921, Eastern Oregon Lumber Company, Enterprise, Oregon.

Herron, Paul A., special, 49 Trinity Place, Portland, Oregon.

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Holmes, Frederick A., 1916, B.S., L. E., mill carpenter, Corvallis, Oregon.

Holmes, J. F., 1920, B.S., L. E., engineer Holmes-Eureka Lumber Company, Corlatta, California.

Hult, Gustaf W., B.S., F., timber examiner, Southern Pacific Company, land department, San Francisco, California.

Hutchinson, Frank C., ex-1919, Corey Apartments, Salt Lake City, Utah.

Jacoby, Carl C., 1917, B.S., L. E., Inman-Poulsen, Mt. Solo, Washington.

Johnson, Willard, 1918, B.S., L. E., electrician, Albany, Oregon.

Johnston, Charles M., ex-1921, Yankton, Oregon.

Johnston, Clarence, ex-1921, Yankton, Oregon.

Jonason, Olaf, 1917, B.S., L. E., cashier Coast Range Lumber Company, Mabel, Oregon.

Jones, Noah, ex-1922, farmer near Corvallis, Oregon.

Kerr, Claude, ex-1922, Oregon City, Oregon.

Koller, Frank O., 1921, B.S., F., Astoria, Oregon.

La Fetra, Vincent H., ex-1923, Glendora, California.

Lankenau, Walter, ex-1918, University of Washington, Seattle, Washington.

Loof, Hans W., 1916, B.S., F., Standard Oil Company, Grants Pass, Oregon.

Luebke, George, 1921, B.S., F., Toutle, Washington.

Lundeen, Arthur R., 1917, B.S., F., assistant manager Mt. Solo Camp, Inman-Poulsen Lumber Company, Mt. Solo, Washington.

Mason, Earl G., 1920, B.S., F., box factory, Castle Rock, Washington.

Matthews, Donald M., 1920, B.S., F. teacher in high school, Newberg, Oregon.

McCaffrey, Lawrence, 1918, B.S., L. E., chief engineer, Kiernan-Flora Logging Company, Kerry, Oregon.

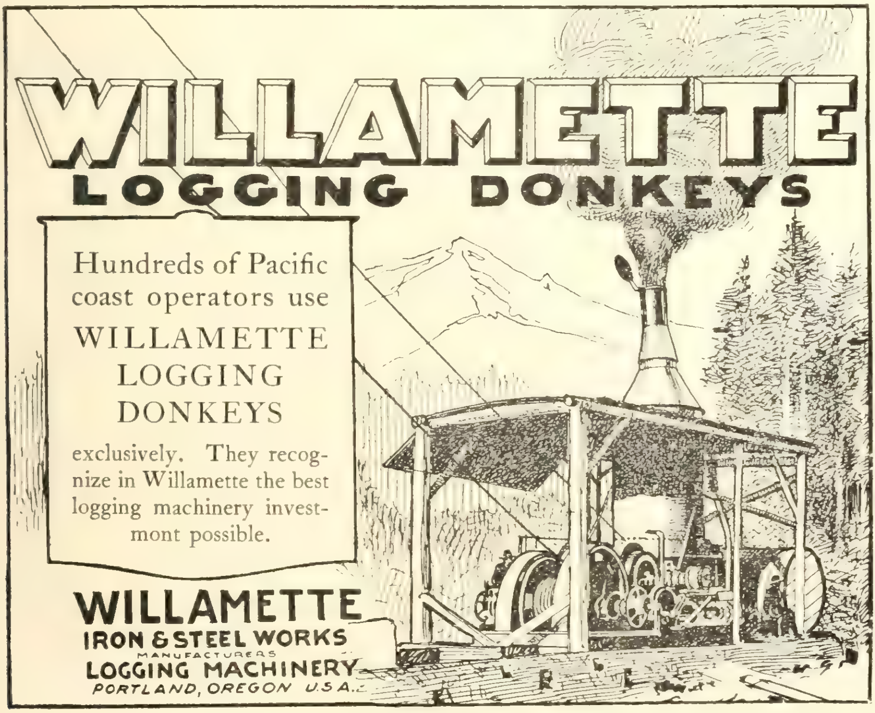
McCollum, John E., 1917, B.S., F., 36 John street, St. Salinas, California.

McCollum, Charles, 1918, B.S., F., city engineer, Salinas, California.

Medley, James W., 1921, B.S., F., United States forest products laboratory, Madison, Wisconsin.

Miller, Carl N., 1914, B.S., F., bank cashier, Enterprise, Oregon.

Nettleton, Harry I., 1921, B.S., F., instructor, School of Forestry O. A. C., Corvallis, Oregon.



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Nillson, Adolf, ex-1911, timber curiser, Portland, Oregon.

Oliver, Burt L., ex-1918, Diamond, Oregon.

O'Neil, Wm. J., 1917, B.S., L. E., Weyerhaeuser Lumber Company, Cloquet, Minnesota.

Patton, Harry C., 1917, B.S., L. E., logging engineer, Mill City, Oregon.

Paulsen, Edward M., 1917, B.S., L. E., engineer, Buehner Lumber Company, Allegany, Oregon.

Pernot, Jack F., ex-1910, deceased 1917.

Raithel, Wm. Fritz, 1911, B.S., F., timber cruiser, 665 East Eighteenth street North, Portland, Oregon.

Regnell, Lloyd C., 1920, B.S., L. E., Long-Bell Lumber Company, Kelso, Washington.

Richey, Lester C., ex-1918.

Rickson, Carl A., 1921, B.S., F., 457 Leo avenue, Portland, Oregon.

Sandwick, Arnold, ex-1923, McMinnville, Oregon.

Shen, Peng Fei, 1920, B.S., F., professor forest and agricultural experiment station, care Canton Agricultural College, Canton, China.

Shubert, Ben W., 1916, B.S., F., Silverton, Oregon.

Smilie, Robert S., 1920, B.S., L. E., engineer, Sunburst, North Carolina.

Spaulding, Clifford, ex-1916, superintendent Spaulding Lumber Company, Newberg, Oregon.

Spaulding, Don, ex-1917, Newberg, Oregon.

Starker, Thurman J., 1910, B.S., F., secretary Western Pine Association, 510 Yeon Building, Portland, Oregon.

Stephens, James T., B.S., L. E.

Storm, Earl V., 1920, B.S., F., grazing inspector, Ephraim, Utah.

Taylor, Herbert H.

Thomas, Herbert F., 1919, B.S., L.E., Albany Lumber Company, Albany, Oregon.

Tilley, Walker B., Arcata, California.

Totten, Benjamin J., 1911, B.S., F., farmer, Corvallis, Oregon.

Tracey, J. E., ex-1922, Long-Bell Lumber Company, Kelso, Washington.

Turley, Harold S., 1913, B.S., F., superintendent Cathlamet Timber Company, Cathlamet, Oregon.

Tuttle, LeRoy J., ex-1917, Box 15, Natches, Washington.

Van Orsdel, Thomas, ex-1917, Dallas, Oregon.

Accounts of Faculty
and Students
Invited

✤

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Wakeman, Wm. J., 1917, B.S., L. E., 405 East Thirteenth street, Portland, Oregon.

Wendover, Royce F., 1915, B.S., F., farmer, Oswego, Canada.

Williams, James W., 242 East 44th street, Portland, Oregon.

Wilmot, Richard K., 1918, B.S., L. E., deceased in service July, 1918.

Wilson, David McKinnon, 1916, B.S., F., Linnton, Oregon.

Wilson, Sinclair A., 1910, B.S., F., President First National Bank, Linnton, Oregon.

Woodburn, Howard R., ex-1918, with Willamette Iron and Steel Company, Portland, Oregon.

Woods, LeRoy, 1916, B.S., L. E., second lieutenant field artillery, Fort Sill, Oklahoma.

Wright, Mark, 1917, B.S., F.

Yates, Lloyd D., 1917, B.S., F., captain, Camp Benning, Georgia.

Young, Ellsworth S., 1921, B.S., L. E., Inman-Poulsen Lumber Company, Mt. Solo, Washington.

Zollman, B. W., 216 Washington street, Klamath Falls, Oregon.

Allen: "What if it gets dark before we get back to camp?"

Jones: "Then we can begin to blaze our trails."

## PHILOSOPHY

All students, great and small,
Are either wise, or not at all
  Endowed with brains.
The wisdomless are terrified,
Studying they've never tried.
  They fall for janes.
Commencement day is far away
For he who plays throughout the day.
  His kind complains.
The lad who wears the student's frown
Is sure to wear the Cap and Gown.
  For him joy reigns.

—By "Easy G."

### The Height of Laziness

Fischer: "Why is it you always want to ride in my Ford?"

Lovegreen: "To save me the effort of knocking the ashes off my cigar."

In typewriting class—Teacher: "You have a good touch, Mr. Holmes." "We know it," groaned his friends in the class.

**Think It Over:** The present hour is the decisive hour, and every day is doomsday.

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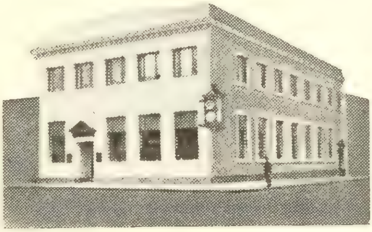

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# Students Registered in Forestry School

These students were enrolled in the school of forestry this year.

The information is arranged: (1) Name; (2) Class; (3) Major subject; (4) Home address.

Adams, Herbert E., Freshman Forestry, Carlotta, California.

Adkins, Charles, Vocational, Corvallis, Oregon.

Allen, Sam S., Jr., Forestry, Portland, Oregon.

Ainsworth, Ollie K., Vocational, Murphy, Oregon.

Anderson, Donald N., Sophomore Logging Engineering, Santa Ana, California.

Bacher, Fred A., Freshman Forestry, Corvallis, Oregon.

Baisley, Wm. O., Freshman Forestry, Jacinto, California.

Baker, Williams, Jr., Freshman Logging Engineering, Independence, Oregon.

Balderree, Elmer W., Senior Logging Engineering, Dallas, Oregon.

Balderree, Robert G., Freshman Forestry, Dallas, Oregon.

Begue, Phillip, Freshman Forestry, Los Angeles, California.

Benedict, Warren V., Sophomore Forestry, Hoquiam, Washington.

Boyle, Wayne J., Vocational, Canyonville, Oregon.

Bremner, Alexander, Junior Logging Engineering, Asoria, Oregon.

Bursell, Homer G., Freshman Forestry, Dallas, Oregon.

Butler, Randon R., Special, Richmond, Oregon.

Cannavina, Anthony D., Junior Forestry, Pasadena, California.

Carr, Ivan W., Sophomore Forestry, Pendleton, Oregon.

Carter, Thomas L., Sophomore Forestry, Long Creek, Oregon.

Chapman, Earl R., Senior Forestry, Riveria, California.

Clark, William E., Sophomore Logging Engineering, Portland, Oregon.

Conklin, Robert P., Senior Logging Engineering, Portland, Oregon.

Craven, Milton M., Junior Forestry, Parkdale, Oregon.

Day, Delbert, Junior Logging Engineering, Portland, Oregon.

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Denny, Merrill, Sophomore Forestry, Etna Mills, California.

Duncan, Gordon A., Junior Forestry, Portland, Oregon.

Dunham, Mark W., Junior Forestry, Portland, Oregon.

Edgerton, Harry L., Junior Logging Engineering, Grants Pass, Oregon.

Edmunds, Milton R., Freshman Forestry, McMinnville, Oregon.

Fenstermacher, Harry, Junior Logging Engineering, Porterville, California.

Fischer, Ernest E., Junior Forestry, Milwaukie, Oregon.

Gervais, Louis, Junior Forestry, Pendleton, Oregon.

Giffee, Willet E., Junior Forestry, Corvallis, Oregon.

Gilbert, Phillip B., Junior Logging Engineering, Long Beach, California.

Gould, Curtis E., Senior Forestry, Hood River, Oregon.

Groce, Eustace C., Special, Portland, Oregon.

Grose, Ira Crawford, Freshman Logging Engineering, Anaconda, Montana.

Hale, Millard P., Junior Forestry, Portland, Oregon.

Hare, Decatur B., Vocational, Tillamook. Oregon.

Heath, James A., Junior Forestry, Raymond, Washington.

Helsby, Leo A., Freshman Forestry, Oregon City, Oregon.

Henderson, John M., Freshman Forestry, La Grande, Oregon.

Hewitt, Thomas H., Junior Logging Engineering, Portland, Oregon.

Holmes, Lee S., Senior Logging Engineering, Portland, Oregon.

Hopping, George R., Sophomore Forestry, Vernon, British Columbia, Canada.

Jankowsky, George H., Sophomore Forestry, Portland, Oregon.

Jones, DeWitt C., Junior Logging Engineering, Fort Wayne, Indiana.

Jones, Sidney C., Junior Forestry, Chehalis, Washington.

Kelly, Wilbur C., Junior Forestry, Portland, Oregon.

Kendall, Leonard, Forestry Logging Engineering, Grants Pass, Oregon.

Kenyon, Edgar Clay, Sophomore Forestry, La Verne, California.

Klinkenberg, William T., Freshman Forestry, Nyssa, Oregon.

Knauff, Wm. John, Junior Forestry, Newport, Oregon.

Lagus, Lorenzo W., Freshman Forestry, Astoria, Oregon.

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Lewis, Trevor, Special, Port Townsend, Washington.

Leadbetter, Henry L. P., Vocational, Portland, Oregon.

Lovegreen, Wilfred D., Junior Logging Engineering, Cherry Grove, Oregon.

Luellwitz, McHenry, Freshman Forestry, Portland, Oregon.

McDaniel, Vern E., Sophomore Forestry, Dayton, Washington.

McEuen, Thomas O., Freshman Forestry, Murphy, Oregon.

McGuire, Kelley B., Vocational, Corvallis, Oregon.

Malhortra, Des Raj., Sophomore Forestry, Kashmire State, India.

Maxwell, Anthony E., Freshman Forestry, Elgin, Oregon.

Melis, Percy E., Junior Forestry, Mist, Oregon.

Mendenhall, Frank, Junior Forestry, Sheridan, Oregon.

Metzler, Glen A., Freshman Forestry, Corvallis, Oregon.

Mielke, James L., Freshman Forestry, Stayton, Oregon.

Moore, Elmer H., Vocational, Tiller, Oregon.

Morgan, Gilbert D., Junior Forestry, Portland, Oregon.

Morse, Clayton C., Freshman Forestry, Milwaukie, Oregon.

Mowat, Edwin L., Sophomore Forestry, Ashland, Oregon.

Mulkey, L. Ivan, Junior Logging Engineering, Corvallis, Oregon.

Murdock, Kenneth McClain, Freshman Forestry, Willapa, Washington.

Nutting, Bernard L., Junior Logging Engineering, Brookings, Oregon.

Osborne, Gifford L., Senior Forestry, Aurora, Oregon.

Owens, Thomas S., Senior Logging Engineering, Raymond, Washington.

Owens, William O., Senior Logging Engineering, Raymond, Washington.

Peavy, Bradley A., Special Logging Engineering, Corvallis, Oregon.

Peterson, Harold, Sophomore Logging Engineering, Portland, Oregon.

Pfeiffer, Karl, Sophomore Forestry, Corvallis, Oregon .

Pfeiffer, Payne, Sophomore Forestry, Corvallis, Oregon.

Phillips, Ray, Vocational, Corvallis, Oregon.

THE Corvallis Printing Company is always keen to do its utmost to present your thoughts to the reader in an acceptable form; to give your work that finish which will engage attention and command respect. At 261 Monroe Street, Corvallis, Oregon.

The Plates in This Publication Were Made by the

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Pieper, Paul, Vocational, Milwaukie, Oregon.

Price, Francis C., Freshman Logging Engineering, Palo Alto, California.

Pryse, E. Morgan, Senior Forestry, Prairie City, Oregon.

Reynolds, Lloyd J., Sophomore Forestry, Portland, Oregon.

Robinson, Temple M., Sophomore Forestry, Corvallis, Oregon.

Rounsefell, George A., Freshman Forestry, Corvallis, Oregon.

Rosser, Earle, Special, Mt. Hood, Oregon.

Rotschy, Samuel, Sophomore Forestry, Vancouver, Washington.

Rubinstein, Boris, Sophomore Logging Engineering, Nikolaievsk, Siberia.

Samon, Judell M., Vocational, Etna Mills, California.

Scott, Genio, Freshman Forestry, Camas, Washington.

Sliffe, Arthur L., Sophomore Forestry, Silverton, Oregon.

Smith, Benjamin F., Senior Forestry, Tygh Valley, Oregon.

Smith, Lawrence H., Senior Forestry, South Bend, Washington.

Spaur, George, Freshman Forestry, Roseburg, Oregon.

Steel, Joseph L., Senior Forestry, Portland, Oregon.

Stevenson, Herbert W., Junior Forestry, Portland, Oregon.

Strong, Clarence C., Junior Forestry, Washougal, Washington.

Sweeney, Edmund J., Junior Forestry, Portland, Oregon.

Switzer, Baynard A., Freshman Forestry, Highland, Oregon.

Thirkill, Albert, Freshman Forestry, Portland, Oregon.

Tousey, Reginald F., Sophomore Logging Engineering, Portland, Oregon.

Tucker, Lawrence E., Sophomore Logging Engineering, Portland, Oregon.

Walker, George S., Sophomore Logging Engineering, Portland, Oregon.

Warren, George E., Sophomore Forestry, Stubenville, Ohio.

Wolfe, Harry McKinley, Sophomore Logging Engineering, Brownsville, Oregon.

Wenner, Adolph N., Freshman Forestry, Newport, Oregon.

Willert, Floyd B., Junior Logging Engineering, Corvallis, Oregon.

Winters, Fred Lyle, Freshman Forestry, Gresham, Oregon.

Wright, Ernest, Freshman Forestry, Portland, Oregon.

## THE RANGER'S REVERIE

There's a locomotive waitin'
Down the canyon's chasmed way,
And a thousand lights are gleamin'
And a thousand hearts are gay.
But I'm sad and sort of lonely,
In the midst of many men
Sort o' longin' for the open
And the lonesome land again.
For a saddle 'neath me creakin'
With the sky line for a goal,
And the weary days of ridin'
On the the long and lone patrol.
Where endless trails are windin'
O'er the rim of rocky ways,
Through velvet vales and valleys
Draped in folds of purple haze.
Where the canyon's breeze of mystery,
Man never yet has trod,
And the silent somber summits
Are the sentinels of God.
The old cow moose is splashin'
Where the river grasses grow,
And the antlered elk are buglin'
And the deer like shadows go.
Where the stars are serenaded
With the coyote's woeful tune
And the limpid lake a dreamin'
Makes a mirror for the moon.
O, the mountain meadows miss me
And my campfire's yellow gleam,
Where the pinion pines are singin'
To the music of the stream.
O, my cabin's snug and cozy
With the horns above the door,
And it's waitin' for my comin'
On the timbered shadowed shore.

—Hugh Peyton.

In spite of winter,
Rain and fire;
Each year they rise
Two inches higher.

But please don't grieve;
It's quite all right.
They soon will be
Up out of sight.

The annual Cruise is a great invention—
The staff gets all the fame,
The printer gets the money
And the editor—the blame.

Prof. Hewitt (in commercial law): Would you consider lightning an "Act of God?"

Bill Knauf: "Certainly, it comes from the heavens, don't it?"

# School of Forestry

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# Fernhoppers Wax Poetical and---Funny

### THE JOB THAT MAKES A REAL MAN

When October's rains set in
And you're wet up to the chin;
When you're standing in the mud from eight to five;
When your shoes get full of water
And your frame begins to totter;
When you're just about the tiredest man alive;

It is then you get to thinking
That you'd just as well be sinking
Into slumber on dad's davenport in town,
Where the fireplace fire is burning
And your rough hands are turning,
Turning white and soft and smooth from healthy brown;

Where you get up in the morning
Without the customary warning
Of the cook who slugs a jangling dinner bell,
Which, with loud reverberations
Causes verbal lacerations
Expletives that make the logger known so well.

You tell yourself you're done forever
With this life of vain endeavor,
Forever done with winter's snow and ice.
And you call yourself a sucker
Spineless servant of a hooker;
You are foolish to remain at any price.

So you draw the pay that's coming
And roll your outfit humming
As you think about the job you'll have in town.
You'll be living in the city
With your hands no longer gritty
Where you never have to work and sweat and dream.

You get a place inside four walls,
Don a suit, ditch overalls,
And at last begin the life of which you'd dreamed.
In the land where big skyscrapers
Like you'd read of in the papers
Loomed up high against the sky at night and gleamed.

You find the urban life great stuff
Until Nature calls your bluff
And presents you with a picture of yourself.
You are pale and soft and nervous
And your eyes don't give good service,
For you've laid the rules of living on the shelf.

Well, you feel there's something missing
And your consience starts to hissing
In your ear that town is not the place for you.
Then pretty soon May comes along
With the robins and their song
When the rain has stopped and skies are turning blue.

In days to come those same four walls
Seem to you like prison halls
And you long to get away and see a tree.
Where a man does as he pleases,
Sometimes roasts and oft times freezes,
But all the same he knows darn well he's free.

So you chuck your outfit in a sack,
Hoist it briskly to your back,
And resolutely beat it for the brush.
At last you know you're satisfied,
Found the things for which you'd sighed,
As you line up by the cook-house for the rush.

Yes, there's something that's alluring,
It's a spell that's long enduring,
That will make you hate the life yet like it, too.
For it's just the old, old story
That the job that makes you worry
Is the one that makes a real man out of you.
—Willert '23.

### IN NINETEEN SIXTY-SIX

The poor old man with his tottering frame
Through the tall grass trudged each day,
And he'd take his place with his telescope
And he would only look one way.

He would look way off toward the sunkist south,
And his face was filled with sorrow,
And the only thing that he would say
Was "They promised me some tomorrow."

A stranger passing by one day
Inquired of a native son
Who is that man that sits over there
With the antique vision gun?

"My friend," the native answered
As he wiped away the tears,
"You shouldn't speak of him that way,
For he's been there for fifty years."

"Why, that man's story to us here
Is as common as the stars;
He's a Willamette Valley lumberman,
And he's looking for S. P. cars."

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*"The Saw Makers"*

PORTLAND, OREGON SEATTLE WASHINGTON
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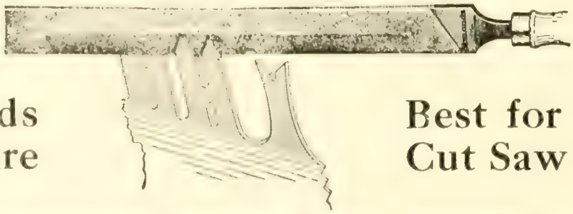

**Simonds Files Are Best for Cross-Cut Saw Work**

## JUST FOLLOW A FORESTER!

Oh, I know the tales
Of Forest trails
Of work in the blazing sun.
Of canned bean diet
And swarming flies
Of lonesome hours
And leaden skys
And a raging fire when the day is done
I've heard and I've been dismayed.

Then why should I,
Or any guy
Stand up full length and say
"A Forester, sir,
You bet I be
That life is the
Only life for me,
And a Forester, sir, I'll stay,
It's a life with a pull for your heart."

Then follow with me the rocky trail up the steep and tree-clad hill,
Stand on the jutting peak and see God's wonder there,
Pause in the dusking forest's depths and hear
The whispering silence of the living air.

Rest after toil that called for the whole of your strength and skill,
Rise in the early greyness, a man renowned and strong.
Feast like the king of the world on the simple grub of the ranger.
Then, Ho! again for the trail, the trail that is steep and long.

For the work that lives
Is the work that gives
A quickening lot of fight.
Nor fires nor rains
Nor toil nor sun
Nor muscle strain
Can spoil the fun
That comes from a dreamless night
And the knowledge of strength to carry on.

—K.—22½

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Fierce lessons,
Late hours,
Unexpected tests
Nothing prepared,
Knocked out.

---

Prof. (in geology class): "The geologist thinks nothing of a thousand years."

Rook: "Great guns! And I loaned a geologist ten dollars yesterday."

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**Think It Over:** Things don't turn up in this world until somebody turns them up.

**Think It Over:** When the great orator was asked what were the three requisites of successful oratory, he replied: "The first is action; the second is action, the third is action."

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Prof. Newins: "I would like some birdseed."

Rook: "You can't feel me, mister. Birds grow from eggs, not seeds.

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**Think It Over:** It is good to do what is right. It is bad to do what is wrong. It is worse to do nothing.

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**Think It Over:** Energy will do anything that can be done in this world; no talents, no circumstances, no opportunities will make a two-legged animal a man without it.

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"Have you heard any snappy stories lately?"

"No, Bremner hasn't been to class for several days."

---

**Think It Over:** The only man who ever makes a mistake is the man who never does anything.

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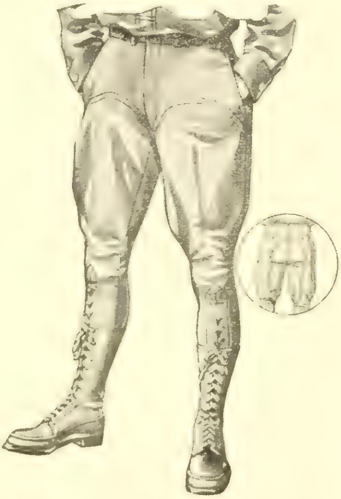

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## THE WEEPING HEMLOCK

The truck pulled over to the side of the road and stopped.

"Everybody off!" Prof. Newins called out, and off we scrambled. It had been a long trip over the hills from Corvallis, and we were glad of the opportunity to stretch a little of the stiffness out of our legs.

During the course of our classes in the Forestry Department we had often been told of a certain tree located on the rising slope of Alsea Mountain, which possessed certain original features unlike those of any other of our nature trees.

The object of our trip this day was principally to view this much-touted curiosity. We all were so used to the ordinary prosaic, everyday, natural sort of thing in dendrology that we could not imagine that the tree grew of sufficient strangeness to arouse our unconscious applause. But we were willing to be shown, and Prof. was anxious to show us.

"Let's go," says Prof, striking out from the open road into dense forest ahead. We splashed through Alder Creek and trailed out behind him. After we had milled around considerably on our own responsibility through the heavy stand of timber and underbrush, "H" led us through a tangle of devil's club and vine maple to the object of our search.

Directly before us we saw silhouetted against a thick background of firs and hemlocks a magnificent tree, standing in a decided contrast to its neighbors, outwardly resembling in no degree, any other specimen on the hillside. This first sight fully repaid us for the long trip we had taken.

It is difficult to describe the peculiar magnificence of this slender, towering tree which shot up a hundred feet and more, from a slender stump to its needle-pointed tip. It stood alone on a separate plot, as if too proud to mingle with the more common-place neighbors. We could not help thinking, perhaps the others kept their distance out of proper respect to this majestic specimen. And nature herself further contributed to the scene of isolated grandeur, by furnishing the surrounding floor with a rich carpet of ferns and evergreen foliage.

Finally some one broke the silence by requesting the scientific name of the tree.

"It is Tsuga heterophylla," Newins answered.

"Yeah," some one spoke up, trying to return to normal, "we had some of that 'what-you-call-it' for dinner last night."

"He means it's a hemlock, you sucker," one of the better informed students interposed, trying to enlighten what he called "dumb-bell" intelligence.

The professor proceeded with his explanation as though unaware of the interruption. "Scientific investigation," he continued, "has proved that it is nothing more or less than a Tsuga heterophylla. This conclusion was arrived at through a comparison of the cell structures, the bark, the leaves, the cones, and the seeds. It varied, of course, in the matter of form which is perfectly obvious to anyone, on the comparison with these neighboring Tsugas," he finished with an explanatory wave of his hand.

"Yes," spoke up another member of the party, "it differs in the exaggerated droop of its limbs," refering to the delicate, downward sweep of the branches, with their intricate network of mossy, leaf-like appendages, as if in attempt to veil her nakedness from any profane eye.

"Exactly," quoth "H," "and through that peculiarity it derives its own peculiar name —the Weeping Hemlock."

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**Think It Over:** The world reserves its big prizes for but one thing, and that is initiative.

"I wonder why the toddle has gone out of favor?"

"It is too expensive. The fronts of the tux and the evening gowns won't stand up under the constant abrasive action."

—Cornell Widow.

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### At the Dance

Co-ed: "I feel a cold coming on."

Ed: "Then you had better go home, dress, and go to bed."

—Dartsmouth Jack o' Lantern.

# REFORESTATION

While the State of Oregon has more standing timber than any state in the Union, and for this reason will not experience any dearth for lumber or timber products for a great many years to come, yet it is equally true that in all of the territory east of the Rocky Mountains, the time is not far distant when they will experience a shortage of lumber and timber products.

A very large proportion of the area covered by the timber region in Oregon is better fitted for a continuous growth of timber than for agricultural purposes and it is well worth while for the people of Oregon to not wait until their timber is exhausted before entering upon a constructive policy for the growth of a new forest. All logged off land not suitable for agriculture or grazing should in our judgment be acquired by the State of Oregon and new forests grown which will belong to the State of Oregon. The only attention that need be given is to keep fire out of the young growth, which will follow naturally in all logged off areas. This land should be acquired at a nominal price from the owner and the State enter upon a systematic policy of developing a new forest that will be available for use when the mature timber now standing is removed.

The State of Pennsylvania has acquired more than a million acres in the Adirondack Mountains for the growth of a new forest and the State of New York has acquired even larger areas in the mountainous regions for the development of a future timber supply.

The climatic conditions of Western Oregon are such that timber grows faster and of a better quality than can be procured in any of the states lying east of the Rocky Mountains, and attention should be given to the patriotic endeavor of utilizing these waste lands for a practical purpose and for the benefit of the entire state.

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# ACKNOWLEDGMENTS

To those who contributed articles, supplied illustrations, and supported the publication of this annual through advertising; to all these the staff of the 1922 Annual Cruise desires to express its appreciation of their splendid efforts.